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NETWORKING FOR SCIENCE & TECHNOLOGY IN LOCAL GOVERNMENT

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Proceedings of the Third Annual Innovation Group Conference September 1978

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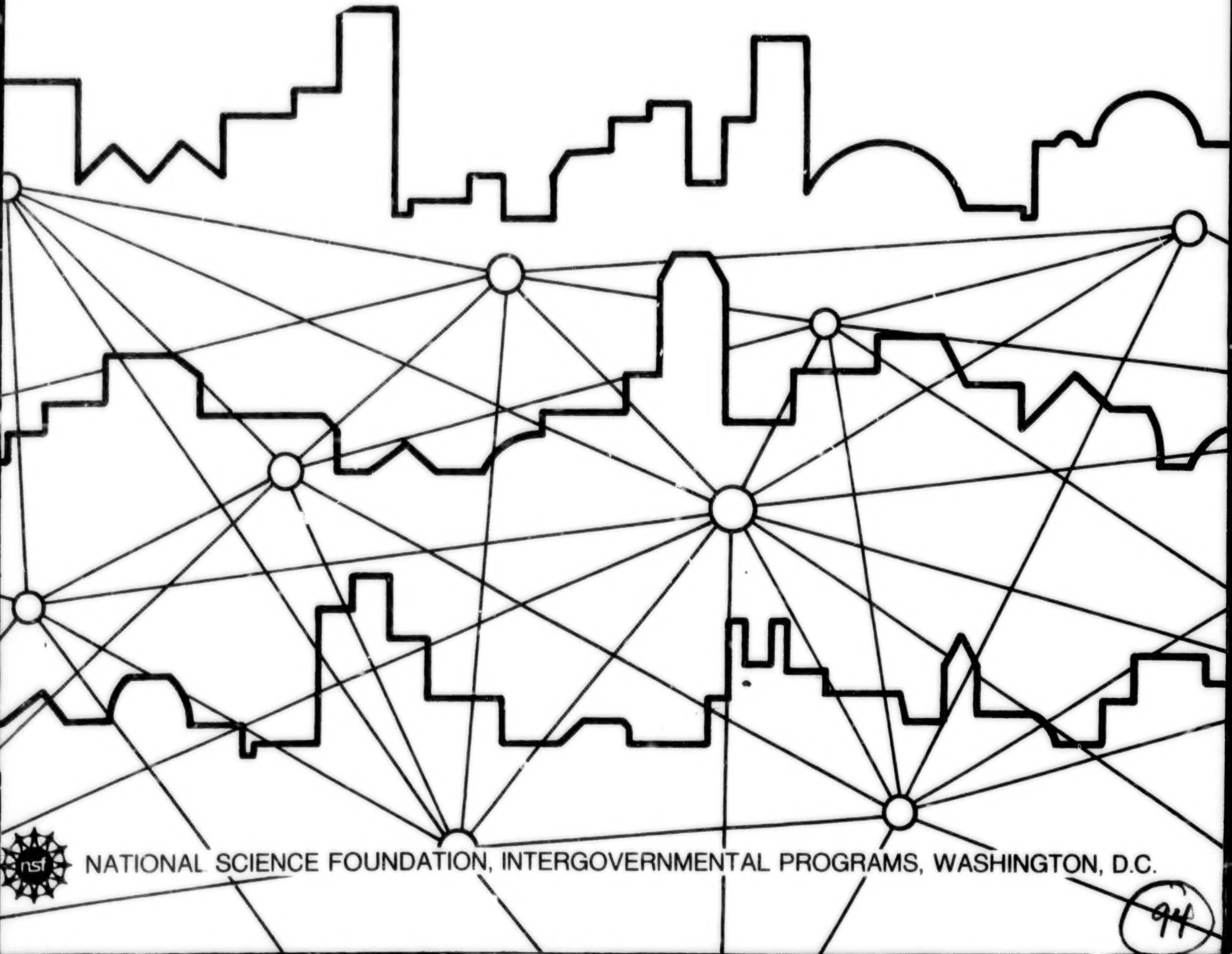

NATIONAL SCIENCE FOUNDATION, INTERGOVERNMENTAL PROGRAMS, WASHINGTON, D.C.

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Within NSF/ASRA, the Division of Intergovernmental Science and Public Technology fosters the integration of science and technology, as a resource, into the policy planning, program planning and program execution activities of state and local governments.

Pursuit of this objective is the principal responsibility of the Division's Intergovernmental Programs component. Intergovernmental Programs directs a mix of projects under a program strategy aimed at assisting state and local governments to improve and enlarge their ability to (1) use effectively scientific methods and resources, and technologies, in planning, decision-making and operations, and (2) increase the cost-effective utilization of federally-sponsored research results for the solution of state and local problems.

Implementation of this strategy encompasses projects having the dual emphases of supporting (1) experimental efforts in a single city, where that city is expected to become the nucleus of a future innovation group, and (2) state, regional and national networks of local jurisdictions, under the concept of aggregating municipal and county efforts into a unified approach to the solution of common problems. More detailed information may be obtained from:

William H. Wetmore, Director
Division of Intergovernmental Science
and Public Technology

Robert C. Crawford, Director
Intergovernmental Programs

Bruce Reiss, Program Manager
Local Government

O. James Linenberger, Program Manager
Local Government

Anna Aiello, Program Manager
Local Government

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PROCEEDINGS

THE THIRD ANNUAL INNOVATION GROUP CONFERENCE

Sponsored by

THE NATIONAL SCIENCE FOUNDATION
APPLIED SCIENCE AND RESEARCH APPLICATIONS DIRECTORATE
INTERGOVERNMENTAL PROGRAMS

Newport, Rhode Island
September 27-29, 1978

Conference Coordinators:

Bruce Reiss
Robert A. Cox

Proceedings Prepared By

Susan W. Woolston
and
Barbara A. Davis

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FOREWORD

In the early fall of 1978, the people involved in the science and technology networks funded by the National Science Foundation gathered in Newport, Rhode Island, to share ideas and responsibility for the future of the networking system. Their goal was to forge a consensus of recommendations for NSF's consideration and incorporation into a long-range Local Government Program Plan.

The first time they had met formally together to exchange ideas was March 1977 in Burlingame, California. At that conference, issues such as communications, sustained funding and long-term common goals of the networking infrastructure were discussed. In October 1977, the second convening of the networks took place in Little Rock, Arkansas. Issues had crystallized by that time to such an extent that conference participants agreed that a formal set of recommendations to govern the networking system's future needed to be drawn up.

Consequently, in 1978, such a set of recommendations was drafted by the New England Innovation Group after consultation with NSF's local government program staff. The resulting twenty-four draft recommendations together with background information on NSF's local government program and existing national science and technology resources became a working paper entitled **Building A National Intergovernmental Science and Public Technology Network.** This paper served as the fulcrum around which the work of the Third Annual Innovation Group Conference progressed.

At the end of the Newport Conference, participants had agreed upon a set of final recommendations - the "Newport Networking Agreements." These were the action items for NSF to consider in the drawing up of a long-range Local Government Program Plan.

These proceedings contain a discussion of how the Newport Agreements were reached: who shaped them and what issues surfaced during their creation. The proceedings also contain the Conference Agenda and speeches and summaries of the Conference sessions. Finally, they contain one-page summaries describing each of the science and technology networks and their S & T support mechanisms, and a list of Conference participants.

CONFERENCE AGENDA

NATIONAL SCIENCE FOUNDATION

THIRD ANNUAL INNOVATION GROUP CONFERENCE

Newport, Rhode Island
September 27-29, 1978
Treadway Inn

CONFERENCE THEME: MAKING NETWORKS WORK

WEDNESDAY, SEPTEMBER 27	
2:00 - 8:00 p.m.	**Registration** - Treadway Inn
5:30 - 7:30 p.m.	**Reception** - Treadway Inn City of Pawtucket Host
THURSDAY, SEPTEMBER 28	
9:00 a.m.	**Opening and Keynote Address** The Honorable Vincent A. Cianci, Jr. Mayor, City Of Providence Chairman, New England Innovation Group Policy Development Committee
9:30 a.m.	**NSF Perspective:** Dr. Jack T. Sanderson Director, Applied Science and Research Applications
9:45 a.m.	**Overview of Local Government Science and Technology Networks** Bruce J. Reiss, Program Manager for Local Government, National Science Foundation
10:00 a.m.	**Coffee Break**
10:15 a.m.	**Managing Our Science and Technology Utilization Networks** **Moderator:** William H. Wetmore, Director, Intergovernmental Science & Public Technology National Science Foundation John Lockwood, Assistant City Manager, San Diego, CA Chairman, Urban Consortium Bob Cox, Director, New England Innovation Group

12:00 Noon	**Luncheon:** Treadway Inn Welcome to Newport The Honorable Humphrey J. Donnelly, III Mayor, Newport, Rhode Island
2:00 p.m.	**Science & Technology Networking: Lessons We Have Learned**
	Moderator: Robert C. Crawford, Director, Intergovernmental Programs, National Science Foundation J. David Roessner, Senior Policy Analyst, Solar Energy Research Institute Joseph N. Baker, Vice President, Public Technology, Inc. Donald Borut, Director, Management Development Center, ICMA
3:15 p.m.	**Coffee Break**
3:30 p.m.	**Linking The Science And Technology Networks**
	Moderator: O. James Linenberger, Program Manager for Local Government, National Science Foundation Bruce Talley, Associate Director, NACo C. Nelson Hoy, Director, Technology Exchange Program, Public Technology, Inc.
6:30 - 7:30 p.m.	**Reception** - Salve Regina/The Newport College - Ochre Court, Mayor Vincent A. Cianci, Jr., Host
7:30 - 10:00 p.m.	**Banquet** - Ochre Court
	The Honorable Dennis M. Lynch, Mayor, City of Pawtucket Member, Intergovernmental Science, Engineering and Technology Advisory Panel
	Alan Beals, Executive Director, National League of Cities
FRIDAY, SEPTEMBER 29	
9:00 a.m.	**Work Session by Conference Participants: Strategies for Strengthening Our Science and Technology Networks**
	Conference Actions to be Taken on Working Paper Recommendations
	Facilitators:
	Wayne D. Wedin, City Manager, Brea, CA - Chairman, CTIP L. Joe Miller, Deputy Executive Secretary, ISETAP Richard Eckfield, U.S. Conference of Mayors
12:30 p.m.	**Luncheon:** Dr. Richard C. Atkinson, Director National Science Foundation

THE NEWPORT NETWORKING AGREEMENTS
September 29, 1978

Representatives of the local government science and technology networks affirmed the following as underlying commitments governing their ten recommendations to the National Science Foundation:

*That the focus of any future system should be on helping the user - the recipient - the person working at the local level - be he or she elected or appointed - generalist or specialist-management or labor - who is directly involved in improving government operations. More attention must be paid to preparing these people to be able to use what science and technology networking can provide.

*That the passage of Proposition 13 and similar measures accords well with the networks' basic objectives: to strengthen the capability of local governments to use science and technology resources and to demonstrate how science and technology can be used to improve performance and reduce the cost of government services.

I. Formal Federal executive and congressional recognition should be given to the local government science and technology networking system. The National Science Foundation should seek a national policy commitment. The networks recommend an Executive Order from the President and Congressional action. Support for the work of the networks should also be included in a national urban policy and addressed when appropriate by the White House Interagency Coordinating Council.

II. NSF should attempt to increase coordination between Federal mission agencies' program and R & D planning and the needs of local governments.

III. NSF should recognize the need for continuing support of the network concept, by requesting sustained funding to maintain the networking infrastructure.

IV. The President and Congress should make funds for the purposes of: 1.) leveraging, 2.) adaptive engineering, and 3.) problem focused research available to support the networks. These should be administered through NSF.

V. The President should, by Executive Order, mandate Federal Laboratories to work with local governments and the local government networks. The Executive Order should mandate immediate support in terms of funds and personnel for the Federal Laboratory Consortium.

VI. NSF should help the networks gain better access to private sector and university resources. NSF's industry and university programs should provide more support to its intergovernmental programs and vice versa.

VII. NSF should support the development of an information exchange system for the networks, including a data base that is built on existing efforts and is easily accessible by local governments.

VIII. NSF's Local Government Program should prepare and promulgate a long-range plan based on the Newport Networking Agreements.

IX. The networks urge that three individuals representing local government be appointed to the National Science Board as soon as possible.

X. The networks urge the ASRA Planning Advisory Committee to add more city and county representatives to its membership.

FORGING THE NEWPORT NETWORKING AGREEMENTS - THE PROCESS

Introduction

At the Third Annual Innovation Group Conference held in Newport, Rhode Island, September 27-29, 1978, representatives of the local government science and technology networks funded by the National Science Foundation convened to discuss the future of the networking system.

The discussions were based in large part on a working paper entitled **Building A National Intergovernmental Science and Public Technology Network**, which contained 24 recommendations designed to assist NSF in developing its long-range local government program plan. Informal and formal discussions of these recommendations culminated in a working session Friday, September 29. Participants divided into three groups and then reconvened for a recommendation-by-recommendation discussion. During the plenary session, the original 24 recommendations were reduced, by consensus, to ten. The Newport Networking Agreements that emerged at the Conference are discussed below.

I. **Formal Federal executive and congressional recognition should be given to the local government science and technology networking system. The National Science Foundation should seek a national policy commitment. The networks recommend an Executive Order from the President and Congressional action. Support for the work of the networks should also be included in a national urban policy and addressed when appropriate by the White House Interagency Coordinating Council.**

Three national networks and several regional, state-wide and substate innovation groups currently exist. While these interact among themselves, they need better access to the research and development resources of the Federal mission agencies, Federal laboratories, universities and the private sector. One initial step toward improving this situation would be formal national recognition of the work being done by the existing networks and their great potential for helping cities, counties, towns and states to solve problems using the resources of science and technology.

At the Newport Conference, all three discussion groups were emphatic about the need for this national commitment and all three agreed that recognition from the White House, OMB, and the Congress was critically important.

Progress toward the achievement of this goal was made in January 1978 when Dr. Frank Press (the President's Science Advisor and Director of the Office of Science and Technology Policy) wrote to the heads of all the networks asking for their participation in the problem identification effort of the Intergovernmental Science, Engineering and Technology Advisory Panel (ISETAP), a subcommittee of OSTP. The next step should be the inclusion of a statement on the value of the networks in a national urban policy. It was also suggested that the work of the White House Interagency Coordinating Council should address the intergovernmental aspects of science and technology networking.

II. **NSF should attempt to increase coordination between Federal mission agencies' program and R & D planning and the needs of local governments.**

Formal Federal recognition should result in a stronger effort to target Federal mission agency program and R & D planning to the needs of local governments as articulated by the networks. Too often, Federal agency R & D and planning are isolated from or irrelevant to local government needs. Also, local governments are often unaware of completed or on-going research. Only infrequently have Federal agency R & D staff sought out needs agendas from other levels of government. Those working in the field to identify potential R & D needs, require assurance that their agendas will be considered and responded to by Federal agencies. Conferees at Newport expressed their support for the strengthening of ISETAP's problem identification efforts.

The existing network system provides a dependable mechanism for compiling a national needs agenda for local governments. Conference participants stressed the point that not all problems are national and that regional and local needs assessment (focusing on particular problems on a region-specific basis) were equally as important as national needs assessment.

III. **NSF should recognize the need for continuing support of the network concept, by requesting sustained funding to maintain the networking infrastructure.**

At the first meeting of the networks in Burlingame, California, in March 1977, the need for a longer range, more permanent funding mechanism was pointed out:

> We need to go beyond the simple rule of thumb that says if what we are doing is valuable to local jurisdications they will pay the total bill, and proceed from that simplistic thinking to a view which recognizes the explicit costs of doing business and those portions of cost which can be picked up realistically by various levels of governments.[1]

In Newport, practitioners again reaffirmed that this was necessary. Some felt that the thrust of this recommendation should be an extension of the time frame - "getting off this year-to-year thing," while others went further, characterizing some sort of permanent funding as a national responsibility.

> There are some things that we felt were supportable in terms of national funding. That isn't necessarily the big part of the program, but there is some piece of administration that keeps the machine working--enough oil in the can to make sure it doesn't freeze up. And we think that is legitimately and maybe perpetually a national responsibility, and we see NSF as a good place for that to be exercised. [2]

The Community Technology Initiatives Program (CTIP) was cited as an example of this need. Given the size of the participating communities, it is unlikely that CTIP could ever become wholly self-sustaining. Local jurisdictions can help pay for specific projects or the work of a technology agent. On-going sustained Federal funding of the networking infrastructure is necessary, however, for science and technology to be used fruitfully by local governments on a regular, dependable basis. James R. Favour, speaking at the Burlingame conference, expressed the need this way:

> Significant progress toward meeting urban needs for S & T applications requires a change in Federal policy assumptions and practices. First, the notion that sporadic investments of 'seed money' will somehow solve nationwide, major urban problems must be discarded. Experience in defense, space, industry and in the domestic public sector strongly indicates the importance of sustained high levels of effort by many parties to achieve significant technological change. This underscores the necessity for continuing major investments in developing and sustaining the organizational capacity for the entire R & D process, from definition of needs and requirements through prototype development, testing and implementation...
>
> While specific function and product oriented R & D may be accomplished in partnership with particular Federal mission agencies and components, the development and continuation of the Consortium and similar joint endeavors is a broad national responsibility which should be met by NSF. [3]

Continuing funding that would provide multi-year financing for the maintenance of the networks would relieve them of time-consuming, resource-diverting annual grant applications and enable them to concentrate on longer term projects with more significant payoffs. Newport conferees unanimously agreed that a source of sustained funding was a prerequisite for the networks to work most effectively in the future.

IV. **The President and Congress should make funds for the purposes of: 1) leveraging, 2) adaptive engineering, and 3) problem-focused research, available to support the networks. These should be administered through NSF.**

These three types of funding have been identified, as a result of the experiences of those working in the field, as vital to making networks work effectively.

Leverage funds are used to overcome inertia and get new projects going.

Leverage funds are needed:

1. when projects cut across mission agency lines and are interdisciplinary;
2. to catalyze multiple source financing (ranging from joint agency to public-private ventures at the local level);
3. to assist innovation groups during their formative years to obtain industry, foundation, state, or local funding.

Leverage funds spread out risk and enhance innovation group credibility. A leverage funding commitment frequently serves as an attraction to secure additional outside funding sources. With regard to leverage funds, it was felt that it was highly appropriate for NSF to play a "brokerage role." If an experimental project needs funding, NSF should first assist by facilitating funding from other agencies. If, however, there is not a mission agency which can or will fund the project (e.g., if it is interdisciplinary), then NSF should be able to provide its own leverage funds.

Adaptive engineering funds were characterized by the networks as "essential to any successful science and technology program." Adaptive engineering funds are those needed to make an existing general technology useful in a specific situation. The technology exists to solve a given problem, but it needs "fine tuning"--adaptation to the particular problem at hand or adaptation to make it usable in a particular location or setting. One point stressed at the Newport Conference was that adaptation is a **major aspect** of technology transfer; very few processes or things can be transferred "intact." One example of successful adaptive engineering is the implementation of the Police Sector Design system in Fresno, California. In this case, an MIT-developed, NSF-funded computer program to improve design of a police beat was adapted for the city's use and resulted in manpower savings and quicker response times.

Problem-focused research is research needed to develop a solution to an identified problem when the technology to solve the problem is not readily available. For example, local government officials have requested that research be done to develop better street patching materials and municipally-oriented fiscal forecasting methods.

A significant finding based on network experiences to date is that these activities, leveraging of funding commitments, adaptive engineering, and problem-focused research, are necessary complementary features of a successful technology utilization program. Accordingly, the networks urged their recognition and funding.

V. **The President should, by Executive Order, mandate Federal laboratories to work with local governments and the local government networks. The Executive Order should mandate immediate support in terms of funds and personnel for the Federal Laboratory Consortium.**

There are over 700 Federal government-supported Laboratories in the nation, employing about 240,000 professional employees. The Laboratories' combined R & D budgets total about $15 billion. These Laboratories have a wide variety of technologies, people, and facilities which can be useful to local governments Examples of potentially applicable technologies include computers and information sciences, building maintenance and operation, energy, environmental pollution control, emergency services and transportation.

At the Conference, participants pointed out that the willingness of Laboratories to provide assistance varies greatly among the Laboratories. Some laboratory personnel have made great contributions, and this should be recognized.

The ability of local government networks to make maximum use of this wealth of expertise in the Laboratories has been hindered because:

There has been no directive from the White House or Congress encouraging or requiring that Federal Laboratories make assistance to local governments a priority activity.

There is little incentive for most DOD Laboratories to engage in civilian-oriented projects.

The Mansfield Amendment is interpreted as restricting the amount of non-military R & D that Laboratories can engage in to three percent.

Federal Laboratories are unable to limit required cost-sharing to only salaries (without overhead charges) when their personnel are detailed via IPA to local agencies. This makes the cost of using such personnel prohibitive to local communities.

Conferees felt an Executive Order was the best way to quickly make resources more available. They expressed their conviction that such an order should be carefully worded to **require** Laboratories to do this, not to make it an optional invitation to participate when it might be convenient. Conferees thought that both Congress and NSF should be enlisted in efforts to get this accomplished.

VI. NSF should help the networks gain better access to private sector and university resources. NSF's industry and university programs should provide more support to its intergovernmental programs and vice versa.

The private sector, universities, and independent R & D organizations have substantial R & D resources which could be tapped more effectively to assist local governments. Few incentives exist, however, to foster such collaboration. In fact, in many cases, excessive Federal red tape and lack of continuity and stability in Federal funding work to constrain R & D in these sectors. In addition, current tax and patent policies were identified as hindering private sector innovation and any consequent public sector diffusion. Within the academic community, research on local government problems is generally not accorded as much prestige as are other forms of research, both basic and applied.

Conferees at Newport felt there was a real need to find better ways to access university and private sector resources but without creating any new institutions or organizations. Conferees agreed that NSF should make it a top priority to investigate how its intergovernmental, industry, and university programs could be made more mutually supportive. More interaction and cooperation among these programs was suggested.

Some suggested that merely stating the need for access was, in itself, not enough:

> And to say we need to access that resource is good, but I think there are a lot of other things going on in the Office of Education and elsewhere that we've got to take maybe a more aggressive pro-active position in relationship to— to make sure that we've got the kind of relationships there that are positive.[4]

In addition, NSF should encourage specific network projects that pioneer ways to draw upon private sector and/or university resources, for example, the activities of the Urban Consortium's Industry Relations Committee.

VII. **NSF should support the development of an information exchange system for the networks, including a data base that is built on existing efforts and is easily accessible by local governments.**

This recommendation seeks to ensure that: 1) the body of existing knowledge applicable to solving local government problems using science and technology is comprehensively assembled; 2) the means for easy access by the networks and, also, by local governments not currently involved in a network is developed; and 3) communication among the networks is as effective as possible.

At the Burlingame Conference, it was suggested that information on a number of levels may be needed, including a basic library of technical briefs and innovations, on-line inquiry capability, bibliographies, lists of names, networks, addresses. The data base should include profiles of users/clients as well as profiles of technical and financial resources (Federal, academic, private, etc.). The data base should be the definitive place to look to determine if problems identified by a particular local government, or group of local governments, have solutions already available somewhere in the country.

Conference participants decided that the data base and communications system could not be separated into two discrete elements (as had been done in the Working Paper), but instead, they recommended that they both become part of a complementary information-sharing effort.

Conference participants stressed the need to build upon and not duplicate existing data bases and to use existing communications channels. Rather than creating wholly new systems, there was more need to "access what is already out there."

Conference participants spent some time discussing the Public Technology, Inc. (PTI) planning effort for the development of a communications system for the networks. Some people stated that their need was immediate and that they hoped this would be the last study before implementation could actually take place. Others said that having PTI lay out a system all the networks could examine and critique for workability, etc., was a good approach. Conferees did stress that the PTI effort should involve potential users as well as technology agents, the Federal Laboratories, and advisors from the private and academic sectors, in the development of the communications system.

VIII. **NSF's Local Government Program should prepare and promulgate a long-range plan based on the Newport Networking Agreements.**

At the Burlingame Conference, the need for a coordinating device for the science and technology agencies and networks was stated:

> ...there's a feeling that, by and large, those of us who are in one way or another involved in technology transfer and utilization, that we're to some extent working together without a common plan---a feeling that there is a need for some sense of direction...

It was also pointed out at Burlingame that the existing networks constituted a body of field experience which should be used to enhance NSF/IP's program planning operations. This recommendation states that NSF should use the Newport Networking Agreements as the basis for its long range program plan. Conferees stated that the Plan should be reviewed at the outset and at regular intervals by local governments.

At the Newport Conference, it was stressed that NSF must take a leadership role in integrating the national and regional science and technology networks and their support mechanisms into a single, functioning network. The development of a long-range program plan will begin to fulfill this leadership responsibility.

IX. **The networks urge that three individuals representing local government be appointed to the National Science Board as soon as possible.**

Participants at the Newport Conference agreed to ask the President to appoint three, local government representatives to the National Science Board. They thought this was an urgent issue and needed more emphasis than had been provided in the working paper. They felt that this would provide a useful and needed perspective. Such appointments are permitted under the National Science Foundation's enabling legislation through the "public sector" qualification. This would also accord well with President Carter's February 25, 1978, memorandum calling for more local government participation in Federal programs and planning.

X. **The networks urge the ASRA Planning Advisory Committee to add more city and county representatives to its membership.**

The need for increased local government representation in the planning for ASRA's future was considered essential by the conferees. No specific numbers were mentioned in this case.

EPILOGUE

Disposition of the Original 24 Recommendations

The working paper contained 24 recommendations. The agreed upon Newport Networking Agreements are only ten in number. This section is to clarify what items were deleted and which were added.

Conferees rejected the notion that a minimum of ten regional innovation groups be established. They did not think an arbitrary number should be set, but rather that innovation groups should be based on a real community of interest. They recognized regional, statewide and substate networks as all being viable organizational forms for science and technology delivery.

Conferees also stated that innovation groups should not necessarily be linked to Federal Regional Councils, although cooperation when appropriate, was desirable.

The working paper had recommended that PTI's role in the infrastructure be reviewed and strengthened. It was suggested that PTI lower its subscription prices, improve its marketing strategy and strengthen its linkage with the innovation groups. It was finally agreed that reviewing PTI's role was the responsibility of PTI's Board, and was not appropriate as a recommendation to ASRA. Many present, however, said they wished to affirm their conviction that PTI needs stronger linkage to the innovation groups.

Conferees also rejected the development of inter-network guidelines, development of a specialized evaluation process, a program to train more science and technology managers, and an experimental technology commercialization center.

Inter-network guidelines were deemed superfluous. On the subject of evaluation, one group thought it should be done on a peer basis. Another said that evaluation efforts for the networks were already under way. The third group combined its objections to both an evaluation effort and inter-network guidelines as follows:

> that if you have a national system of evaluation and guidelines on how you're going to interrelate, that you're going to have the system being driven from the top down and there's kind of a strong home rule feeling in our group...that the users ought to drive the system...they can figure out how they're going to communicate and how they're going to most effectively maximize the resources...it would be more useful to give us a book with the phone numbers of the players.[5]

With regard to the recommendation that NSF encourage the training of more science and technology managers, conferees agreed that "we don't need any more science and technology managers, we need to work on training local managers to manage science and technology."

With regard to the recommendation that an Experimental Technology Commercialization Center be established, conferees ageed that NSF should not establish such an institution, but that commercialization is an important policy issue for the networks. As one group reported: "We dropped the idea of a technology commercialization center, but made a policy statement that that is really the unbroken promise that needs to underlie a lot of our work and needs to be out there."

Conferees agreed that their recommendations should have a prefacing statement. They felt this should recognize the overriding supremacy of the "human factor" in the networking process. The user--the client--the he or she working each day within a certain set of given political and administrative relationships; here is where the innovation process is really going to happen or not. As Joe Baker stated: "Let's transfer the emphasis from the network, one to the other, to the client, and in so doing bring the work of the innovation group closer to the local government official."

Conferees also thought that the prefacing statement should point out the compatibility of Proposition 13 and similar measures with the objectives of the networking system

Another sweeping agreement of the conferees about the overall structure of the recommendations was that although specific dollar amounts to support specific recommendations requiring funding should not be mentioned, there was a need for a cross-cutting policy statement about the funding that will be necessary to effectuate the recommendations.

Finally, the following three points were made during the discussions, and while these did not become recommendations, they deserve mention to complete the record of the Newport Conference:

1. More attention should be paid to the marketing and outreach aspects of networking so that more practitioners, especially elected officials, can become aware of science and technology resources.
2. Leagues of cities and towns and associations of counties should be involved as much as possible in the networking process.
3. Regional differences in science and technology programs must be recognized and respected; not everything can be addressed on a national basis.

---

[1] Quotation (source not cited) in **"Networking for Science and Technology in Local Government,** Proceedings of the First Annual Innovation Group Conference, March 1977, p.18.

[2] Wayne Wedin, Remarks during Plenary Session, September 29, 1978, Newport Conference.

[3] James R. Favour, Prepared Remarks on the Urban Consortium for Technology Initiatives, **Networking for Science and Technology, Op.Cit.,** p.132.

[4] Wayne Wedin, Remarks during Plenary Session, September 29, 1978, Newport Conference.

[5] **Ibid.**

KEYNOTE ADDRESS

Presented By

The Honorable Vincent A. Cianci, Jr.
Mayor of Providence, Rhode Island
Chairman
New England Innovation Group
Policy Development Committee

I am delighted to call this conference to order and to welcome you to New England and Rhode Island, the beautiful ocean state.

I like the theme of this conference, **Making Networks Work.** Those three words say a great deal about the character of the people coming here to participate in these conference proceedings. The first word "making" indicates creativity and productivity which are characteristics very much a part of this state's and New England's heritage. The second word "networks," has dropped into my vocabulary ever since I ran into Bruce Reiss and Bob Cox and their crowd a couple years ago. It is an unusual word and not the type of expression a mayor of a major urban city uses freely with all members of his staff or certain groups among the public. But, I like the word and I hope this conference does something about strengthening the networks which NSF has fostered around the country. I see a lot of benefits from the networking process but Bob Cox will get into that subject in more detail later this morning.

As to the last word in your conference theme, I like Webster's definition of work which reads:

"A sustained physical or mental effort to overcome obstacles and achieve an objective or results."

Every elected official in this room understands the meaning of that word particularly when it applies to that time in your political life just 40 days before an election. However, the work being considered at this conference is spelled out in those several recommendations contained in the draft working paper which was prepared by Susan Woolston and Bob Cox. If this conference can breathe life into half those recommendations, then I am confident we will be able to make our national and regional networks work.

Eighteen months ago, in March 1977, I participated in NSF's First Annual Innovation Group Conference which was held somewhere near the San Francisco airport. At that time, I had served as chairman of NEIG's Policy Development Committee for less than six months. However, even then I was deeply committed to this marriage of the politician and the scientist, the professional and the administrator, in order to call upon the best thinking available to solve today's problems with today's technology. Nothing has changed in my commitment to help build a National Intergovernmental Science and Public Technology Network, but it certainly seems that not many of our federal resource agencies have "caught the fever."

Incidentally, mentioning catching a fever makes me wonder about what has been going on at NSF. I distinctly remember being with Bill Wetmore, Bruce Reiss, and Nick Montanarelli at the **First** Annual Innovation Group Conference in March 1977. Now, just a mere 18 months later, I am privileged to be the keynote speaker at NSF's **Third** Annual Innovation Group Conference. No wonder NEIG and the other innovation groups have funding problems. If you people at NSF are able to squeeze three annual conferences into one eighteen-month period, I think I see why Senator Proxmire keeps such a sharp eye on your activities. But then, maybe I am missing some new technological developments which can play tricks with one's mind as well as the calendar.

But let's get back to the task before us here in Newport. On top of the capitol of this state is a statue of the Independent Man. As some of you history buffs may recall, the founder of Rhode Island was a very independent character named Roger Williams. One of the things I like about that man was that he included the "Right of Rebellion" among his principles of democratic government. Apparently, a large number of Californians are following Roger Williams' style because as we are well aware, the citizens of this country are in a state of at least extreme agitation, if not outright rebellion, about the performance of government at all levels. Those of us associated with the intergovernmental science and public technology effort are caught in a vise which if allowed to close will shut off one of the most potentially useful problem-solving capabilities ever developed in the history of this country. There isn't a person in this room who hasn't been part of the political and bureaucratic shuffle which has promised so much, and in the eyes of many of the voters delivered so little. For example, why did it take HUD 14 months to transfer $10,000 to NSF to support NEIG's first application of infrared remote sensing technology to this region's serious energy conservation problems? That is just not acceptable performance and cannot be tolerated any more than the citizens are going to permit local officials to refuse to look at their own municipal operations and the effectiveness with which they are delivered.

One of NEIG's original objectives was to try and implement the recommendations of the Federal Council for Science and Technology March 1974 report on the intergovernmental use of Federal R & D laboratories. The findings and recommendations in that report look like the first draft of the working paper which has been prepared for this conference. I know some progress has been made over the last four years (for example, the people of Providence elected me Mayor). But I am both concerned and frustrated that so little seems to have been done to remove the barriers to the more effective utilization of science and technology as a tool for local government problem-solving. Let me share with you some of my disappointments and along the way I will make a few suggestions which I hope will be included on your agenda of issues over the next two days.

The 1974 report indicated there was an absence of affirmative policy among federal agencies concerning their participation with state and local governments in technology utilization activities. Recently, I saw a copy of a letter from the Undersecretary of Defense which was written in response to Dr. Frank Press' May 22nd letter inquiring about the activities of Federal labs in helping to solve technical problems of state and local governments. My reading of that Department of Defense letter indicated that very little had changed since 1974.

Closer to home, many of you know NEIG's energy conservation program has been a success primarily through the expertise we have found at the U.S. Army Cold Regions Research and Engineering Laboratory. A major drawback to NEIG's making greater utilization of this laboratory is its management's inability to waive certain overhead charges on IPA mobility assignments. On March 27, I wrote to Dr. Frank Press about this significant barrier to technology utilization, but as of yet apparently nothing has been done. Bob Cox tells me I raised a "hot issue" but that's what I thought NSF gave us funds to do. I would be delighted if this conference resulted in an answer to the question I raised six months ago.

Another barrier identified in the March 1974 report concerned budget limitations on technology utilization activities. Now, four years later, it appears all of us, including NSF, are in no better shape than we were then. I find it hard to believe that the National Science Foundation must support the Federal Laboratory Consortium in order to secure their participation in technology utilization activities. Isn't it possible that the Department of Defense could assign and pay for a science and technology advisor for each NSF-supported innovation group? If that was done with NEIG, we could free up to 20 or 30 thousand dollars for adaptive engineering purposes. I hope this conference will consider this recommendation during your discussion on Friday.

Another finding from the 1974 report identified the potential counter-productive impact of uncoordinated marketing by the Federal laboratories. Apparently this problem has not gotten out of hand primarily because the Federal Laboratory Consortium is beginning to have an impact on networking its own members. I'm sure this type of performance can be traced to the talents of people like Nick Montanarelli and Bruce Reiss, and I want to take this opportunity to thank both of these gentlemen for the professional manner in which they have worked with NEIG over the past couple years.

Most NSF-funded projects are expected to submit findings and recommendations. NEIG has submitted several of these, many of which have found their way into the working paper prepared for this conference. What I am concerned about is what has NSF done with all these inputs from state and local participants in their Intergovernmental Science and Public Technology Programs? I suggest that a summary be prepared of all the innovation group findings and recommendations submitted to NSF over the past four years. Don't you think they would make a fascinating appendix in the proceedings to be developed from this conference? I hope Bill Wetmore and his team like my suggestion, and will provide Bob Cox with some additional assistance so he and Susan Woolston can include this valuable information in the material they are gathering from this conference.

My last point this morning is directed toward that most persistent and frustrating problem experienced by all NSF-funded innovation groups. When will the other Federal agencies recognize the importance of NSF's national and regional networks as a delivery system for helping innovative local governments to improve the delivery of critical public services? Isn't it time that NSF's leadership be matched in a consistent and continuing manner by the other major Federal agencies? Please note I am not asking for more of the type of assistance which merely generates additional "Needs Assessment" reports. What I and other elected officials are looking for is the type of "Adaptive Engineering" assistance capable of generating solutions, not just reports about solutions. For example, the City of Providence and its 30,000 employee jewelry industry are confronted with an extremely complex and costly environmental management problem. Until NSF sponsored NEIG, this area lacked the "Intergovernmental Technology Broker" needed to link the public and private parties with the problem to the science and technology resources capable of solving that problem. Everyone in this room knows that organizing to solve a problem is a lot different than organizing to study a problem. NSF apparently understands this rather fundamental fact, but for some reason most other federal agencies seem to lack the policy and program resources to pick up where NSF must leave off.

I am concerned about the new $25,000,000 proposed in the Woolston-Cox working paper. Believe me, they are not my estimates, but I am convinced that unless the other Federal resource agencies recognize their science and technology utilization responsibilities, then those of us in local government must press from all sides for these new implementation funds or we must drop out of NSF's network. I am convinced that most of the money recommendations in the conference working paper can be scaled down or eliminated if someone, or some agency, can get the Federal executive departments to sharpen their management skills and redirect more of their program resources into direct problem-solving activities. I am not sure whether NSF or Dr. Frank Press' office should take the lead on this critical issue -- and I'm not sure I really care but I am certain something must be done and it must be done quickly.

I was elected in 1974, the same year the Federal Council for Science and Technology report was issued. My day of accountability to the people of Providence is November 7th, just six weeks away. Isn't it about time that those of us associated with building a National Intergovernmental Science and Public Technology Network take account of where we are, what we have accomplished and what remains to be done? This conference provides the best opportunity any of us will have for some time to "put our thing together." I wish you well in your deliberations. If you fail, there may not be a Fourth Annual Innovation Group Conference.

NATIONAL SCIENCE FOUNDATION PERSPECTIVE

Remarks by

Dr. Jack T. Sanderson
Director, Applied Science and Research Applications
National Science Foundation

It is a great pleasure for me to welcome you to the Third Annual Innovation Group Conference.

I'm glad to see that together, we are still forging new structures and new relationships between science and technology, and local governments throughout the nation. This relationship depends strongly on you — aggressive, talented local government officals, and technology transfer agents — sitting in the "drivers" seats — innovating and shaping this small but exciting program. And I think that's the way it must be!

Last year in Little Rock I told you we welcomed your views. I'm here today to reaffirm that position and pledge to you that Dr. Atkinson, Bill Wetmore, Bob Crawford and I are awaiting the outcome of this conference to help crystallize future recommendations for the local government program.

Last year, I also indicated a desire on my part, to receive input from you to our Office of Problem Analysis. Your input took on an important new aspect as it became the basis for Frank Press' assessing the R&D needs of state and local government. NSF, with assistance from AAAS, is providing ISETAP with reports on 35 or so of the highest priority problems. These reports will assess the nature and extent of knowledge applicable to the problems, discuss the R&D still needed, and suggest federal programs and responses. The schedule for this effort calls for it to begin impacting next year's budget - the FY 80 budget. Full scale impact should occur by FY 81. Frank Press has emphasized the importance of this effort — and his intent to use the results in his conferences with agency heads. Also last year, I suggested the submission of names of public sector people to serve on the advisory committees of ASRA. I know that input from you and the Public Interest Groups is very important. State and local representatives are now on our advisory committees in the Division of Applied Research. I welcome your further recommendations and am willing to consider the addition of local officials if you will provide me with some alternatives. So please give us your inputs. Bill Wetmore will coordinate this effort for me, but let's get it accomplished within the next few months, as the two year rotational cycle is occurring now.

I have read with interest the preliminary recommendations to us which you will be discussing at this conference. First of all, I commend you on your vision and perception -- your ability to bring the issues together. Secondly, I congratulate Bob Cox and Susan Woolston on their articulation of those issues and strategies in their "working paper". Thirdly, I forewarn you -- I believe, at this particular point of time, your budget levels are overly ambitious. This is a time for constraint; a time to retrench and consolidate; to hold to a minimum level of growth which can readily be supported by your mayors, councils, boards of supervisors, Congress and the general public. Whether we like it or not, the Proposition 13 "mind set" is here! Therefore, we need to maximize the scarce resources available, not only from the universities and private sectors, but from the various federal agencies as well. Bob Crawford and Bruce Reiss have been working hard to obtain programmatic funds for your network from other federal agencies. While we cannot announce any successes here today, we are encouraged about the possibility of a couple of interagency agreements at about $1.0 million level per year each.

By the way, I am not suggesting a "no growth" position for your program. I am really suggesting a well thought out, defensible and rational plan for the local government program area; something similar to the working paper you will be discussing today and tomorrow. I pledge to you my personal attention to your requests and my support for a strongly justified program based on both opportunity and need.

Finally, I thank you for making our/your local government program so successful. I believe we are breaking new ground in a newly developing policy for science and technology utilization by local governments - a policy which considers rural as well as urban locations - counties as well as cities - the private sector as well as public sector - which matches the ability to do with the motivation of **need** -- a truly intergovernmental capacity "sharing" for a better life and environment tomorrow.

Again, thanks!

OVERVIEW OF LOCAL GOVERNMENT SCIENCE AND TECHNOLOGY NETWORKS

Remarks by Bruce Reiss
Local Government Program Manager
National Science Foundation

My name is Bruce Reiss. I am Program Manager for Local Government at the National Science Foundation and I want to thank you all for coming and for making yourselves a part of what I think is a very important meeting. We are expecting this conference to really be a working conference, a shirt-sleeve type session -- and quite frankly, we are hoping that any actions that come out of this conference are going to be actions that will come to the National Science Foundation as your recommendations to develop, with us, your local government program. We want your recommendations to be targeted to the National Science Foundation and your thrusting to be more particularly to the local government program.

As Mayor Cianci said, this is the Third Annual Innovation Group Conference. The first was held in Burlingame about 18 months ago. At that time, as I recall, it was Jim Favour from Dallas, Texas, who articulated it best when he said "what we really need is a 'plan' to focus where all of these networks are going -- these regional networks and the national networks and support mechanisms and we need to know how in the world we all fit into that scheme of things."

That was again stressed by you at the Little Rock, Arkansas, Conference when Carleton McMullin was our host. And again, at that time, you were saying "we kind of like what we are doing, we like what we are involved in, but we do not see how it is all coming together -- how it leads to some kind of logical whole."

Now, at the Little Rock Conference, we made a commitment that you would have some kind of document to talk from at this Conference. Bob Cox and Susan Woolston did an admirable job, I think, of pulling the working paper together for us. I hope if you have not read it, that you will read it between now and tomorrow morning. At least you should read the recommendations section. I think there are 24 recommendations and they are some of the key issues that, as we are winding up tomorrow morning, we are going to be taking item by item and having you grapple with them. The document is really a "gleaning" of inputs that have come from you at the prior Innovation Group Conferences. They have come from some of the speeches that some of you have given at other places. And they have come, I think, from your discussions with Anna Aiello, Jim Linenberger, Bob Crawford, Bill Wetmore, and me.

I guess I would like to consider today and tomorrow as kind of a series of public hearings since you are from local government, where each one of you will get a chance to really participate and let us have your ideas. What we are trying to do is come out with a national network that is stratified and also represents a regional set of sub-elements in that national network -- but one network -- the Urban Consortium, UTS, CTIP, support mechanisms and the regional innovation groups.

I happen to be very enthusiastic about this program -- I am also an optimist. However, I agree with Dr. Sanderson, -- I think the dollar figures that are in the report are a little bit ambitious, although Jack, I want you to know that if you would like to make that kind of a dollar recommendation for us, we would appreciate it and we would be glad to accept the money. I think we could use that money in the program.

Anyway, we need your help. Please do a good job for us!

MANAGING OUR SCIENCE & TECHNOLOGY UTILIZATION NETWORKS

Remarks Prepared by John Lockwood
Assistant City Manager, San Diego, California
Chairman, Urban Consortium

Delivered by Ted Tedesco

I would like to divide my presentation this morning into two parts. I would first like to tell you a little about the Urban Consortium and then to address the subject, Making Networks Work.

The Urban Consortium is a coalition of the Nation's 28 largest cities and eight urban counties. We focus on the R and D needs of the Nation's major urban governments.

The Consortium represents over 20% of the nation's population with a collective purchasing power in excess of $25 billion annually.

The idea of a consortium of large jurisdictions devoted to addressing the subject of technology transfer originated in 1973 and 1974, during discussions between representatives of Public Technology, Inc. (PTI) and the elected and appointed representatives of a number of the nation's largest cities and counties.

These discussions led to the creation of the Urban Consortium as a national forum to identify and address the technological needs of heavily populated urban areas.

The idea behind the Urban Consortium is basic. Organized local participation in research programs helps assure that R and D efforts respond to the most critical local government problems, and that tested solutions can be used by many governments.

The need for the Consortium stems from the recognition that:

1. Large urban jurisdictions have ever increasing demands for service while at the same time are experiencing demands for a decline in the level of tax support. As a result they have explicit and pressing needs for the application of technology.
2. These jurisdictions had and still have requirements for solutions which differ from requirements of smaller jurisdictions because of the magnitude and intensity of the problems experienced.
3. Linking large urban governments in a consortium can assist in identifying common needs, establishing priorities, identifying alternative solutions and alerting product suppliers and R and D resources to the existence of an aggregated market.
4. A consortium can be the means for large jurisdictions to work cooperatively with one another, with Federal agencies, and with other organizations in research development and technology transfer.
5. Individual jurisdictions with a very few exceptions simply do not have the clout to unilaterally affect the national urban agenda. In more instances than I am happy to report, individual cities were played off one against the other in their quest for federal support for a given program.

A word about the Consortium's goals and objectives. The Consortium brings local and federal officials, leaders in private industry, academic leaders and other representatives of the research community together in a coordinated problem-solving effort. The Consortium is designed to address urban problems that can be solved with existing technology and encourage additional research for development of new technology where required. The Consortium's two broad goals are:

1. To link large urban jurisdictions in a cooperative effort to increase the use of technology in urban planning and program execution.

2. To establish institutional arrangements among large urban jurisdictions and all sectors of the research community to improve the delivery and implementation of technology applications to meet urban needs.

The specific objectives of the Consortium are to:

1. Define within each program area, an agenda of common urban problem statements.
2. To develop via a structured approach for priority setting a consensus of the member jurisdictions on research and development priorities.
3. To formalize the commitment of large urban governments to participate in the cooperative research and development activities of Federal agencies and private sector organizations.
4. To encourage Federal and private sector investment in the development of solutions to priority issues using the benefit of market aggregation to interest R and D investment.
5. To organize representative user/design committees to ensure that a system, product or service being produced or transferred conforms to the requirements and specifications of Urban Consortium jurisdictions.
6. To provide for the testing of products and processes in member jurisdictions.

   To build institutional relationships among Consortium member jurisdictions, other urban governments, Federal agencies, industry and business, universities and national associations.
7. To develop an information exchange system to improve the transfer of technology among jurisdictions and from other sources to member jurisdictions.
8. Each Consortium jurisdiction is represented by an official delegate who serves as its permanent representative.

   The delegate reports directly to the chief elected or appointed official of their jurisdiction. General policy is set by the 36 member jurisdictions. Day-to-day operation is assigned to PTI who acts as secretariat under the guidance of the Consortium Steering Committee. The Steering Committee is composed of 11 Urban Consortium representatives elected from the membership. There are three standing committees:

   1. The Needs Committee - Oversees the needs identification and priority setting process.

   2. The Information Committee - Promotes the flow of relative information to and among Consortium jurisdictions.

   3. The Industry Relations Committee Develops working relations with the private sector.

The technical work of the Consortium is performed through ten task forces. Each task force is composed of from 10 to 12 senior level urban government officials with expertise in the task force's subject area.

That's the Consortium, what it is, what it does and why it was formed. I would now like to use the Consortium experience as one technology network case study to describe what worked and what didn't work and to identify some problem areas.

NEEDS ASSESSMENT - The initial needs assessment effort, which was a major undertaking, worked quite well. We found that there was considerable commonality among the jurisdictions who participated. Sure, snow removal problems hold little interest for Miami Beach and beach cleaning isn't a major problem for Denver, Colorado, but on the whole, the expressed needs of the member jurisdictions were remarkably similar. The needs assessment update, which must be done periodically, was not as successful. Jurisdictions tended to review and in some cases simply re-rank former needs rather than indicating new, more current needs. The Steering Committee of the Consortium will be addressing this problem at our quarterly meeting next month in New York.

JURISDICTIONAL COMPETITION Jurisdictional disputes and competition for grant funds which were anticipated by some, with a few very minor exceptions, did not materialize. The jurisdictions proved by their actions that it was the success of the project which was of prime importance rather than receipt of an individual grant or the acknowledgement of leadership in any particular area.

SECRETARIAT - A full-time secretariat, in our case PTI, was important and is really the glue that holds the Consortium together, as it insures a coordinated effort between the various task forces, the members of which seldom, if ever, see one another.

JURISDICTIONAL REPRESENTATION - Our experience has been that the selection of the jurisdiction's representative is key. Some large and nationally significant cities have contributed very little to Consortium activities simply because the individuals designated by those jurisdictions have taken little initiative and indicated little interest. I am happy to say that these are isolated cases and the great majority of our jurisdictions are represented by interested, involved, motivated people. A second problem, however, is that a jurisdiction is almost totally dependent upon the appointed representative to communicate Consortium activities to the appropriate city/county staff persons and to communicate the feeling of the various staff persons back to the Consortium membership. We recognize that this is a problem and we shall be working to correct it.

COMMUNICATION - Communication with other national networks has been a problem for us. I'm afraid that there has been some unnecessary duplication of effort and we have not kept those other networks as informed as we might regarding our activities. In short, we have done our thing, and the other networks have done theirs and it is only recently that we have really addressed the problem of inter-network communication.

FUNDING - I won't dwell on this but it is a fact that an inordinate amount of staff time and Consortium membership time has been devoted to the constant battle of obtaining task force funding. This is valuable time that more properly should be devoted to technology transfer and urban problem-solving.

MISSION AGENCY RESPONSE - The National Science Foundation, the Department of Transportation and the Department of Housing and Urban Development were the early leaders in responding to requests for support and assistance which were made by the Consortium. For the past four years, one of our prime objectives and one that has required considerable effort on our part is to impact the Federal agencies' R and D agendas. In short, some agencies responded a little sooner than others; but I am pleased to tell you that more and more interest is being shown with each passing year.

OVERLAP - Some subject areas overlap task force assignments and we must be careful for we either duplicate effort or an important need may not be addressed. For example, air quality standards affect transportation activities and public works activities. The Consortium has both a Transportation task force and a Public Work/Utilities task force. In the first year or two, this caused us a real problem, but with PTI's help I think we've pretty much eliminated it at this time.

TASK FORCE MAKEUP - The Consortium struggled with a decision as to an appropriate number of task forces. On the one hand, the more task forces we have, the more specialized we could become in selecting task force representatives; but task forces cost money -- a lot of money. On the other hand, fewer task forces pose a problem in balance. As an example, the Consortium's Municipal Finance and Personnel task force was comprised of nine members - five with a general management background. The task force simply could not intelligently deal with personnel issues until that situation was corrected.

MEETINGS - The Consortium holds an annual meeting which is normally one day in length. Unless a jurisdiction's Consortium representative is also a member of either the Steering Committee or a task force, this one-day meeting is the only direct interaction a representative has with fellow Consortium representatives. This is simply inadequate if we expect a contribution from that representative.

It is for this reason that we try to insure that Consortium representatives serve in some additional capacity in order that they can keep current.

PRIVATE MARKET - We have just not been able to impact the private market as rapidly as I would have liked. The potential is there, and while there are some problems with conflict of interest and competitive bidding, impacting that market certainly is worth our continued effort as the reward is substantial.

CONSORTIUM AGENDA - As the Consortium moves into its fifth year, we hope to

(1) streamline our needs assessment process.

(2) improve our communication with other networks, with fellow Consortium members, and departments and divisions within member jurisdictions.

(3) Develop a strategy for impacting private industry R and D efforts,

(4) Address the question of long-term task force core funding.

(5) Improve our existing relationships with mission agencies and develop new good working relationships with those agencies with which we have not worked closely in the past.

(6) Continue to rotate assignments within the Consortium thereby encouraging the broadest possible representation in Consortium activities.

(7) Develop a close working relationship with those Congressional offices which are most active in technology issues.

MANAGING OUR SCIENCE AND TECHNOLOGY UTILIZATION NETWORKS

Remarks by

Robert A. Cox
Director, New England Innovation Group

How do you manage this kind of animal called an Innovation Group? One of the problems in this business is definitions. A suitable definition of management to me is trying to improve the use of limited resources. The resources are people, money and time. How do we know when we are successful as managers? One test that I would be willing to be measured against is whether we have achieved more with the same set of assets.

Now, what is management really concerned with? Primarily it deals with coordination. It deals with the manipulation of things - paper, machines, office space, automobiles, duplicating machines. What we are trying to do is get some efficiency out of the use of those things and we are trying to get some consistency in the way we use them. The more difficult side of coordination is blending the differing views of people and institutions - how you blend those things is an art, not a science.

How about the management of intergovernmental science and public technology. Let us take the **intergovernmental** part first. I think intergovernmental relations - the process, the function -- is designed to increase the communication of ideas and also coordination in policy development. HUD should talk to DOE and CSA and NSF. And, we ought to talk more to ourselves. But it is tough to budget for that kind of thing. Budgeting at every level of government for that kind of increase in communications is tough to justify. Finally, I think intergovernmental relations provides a bridge between the generalist and the specialist, elected officials and administrators.

Now a third and final definition: **technology utilization.** I think it is a process which transforms knowledge into marketable products and services. Technology utilization in my definition is an entrepreneurial action and is concerned with more than one institution or one federal program. It is concerned with a field of need. These then are my definitions of management, intergovernmental relations and technology utilization.

Now, how have I tried to operate those things? Let me give you some characteristics of what the New England experiment has been all about. (I am quoting from the original grant application which I consider to be a work order). First, the work order issued in 1975 said that we should use municipal leagues or similar public interest groups to reach local officials and aggregate markets based on their needs. Next, it said we were to demonstrate the effects of using circuit rider technology agents on a statewide basis, as opposed to placing them in individual cities. This has created an issue here in New England because the CTIP program is providing services to aggregates of cities. Both are legitimate, the management task is how to blend these objectives together. Number 3. We were funded to create a regional network of users and resources and that is what we are trying to define here today, Number 4. We were to attempt to use the Federal Laboratory Consortium as our prime technology resource and Mayor Cianci made reference to the 1974 report on the Laboratories. Number 5. We were to demonstrate the economic development impact of a regional technology utilization program through the aggregation of some unmet public needs. We were to link those unmet public needs to some underutilized science and technology resources. Number 6. We were to place a special emphasis on the development of minority enterprise. And finally, what we will concentrate on today, we were to demonstrate how science and technology can be used to help solve a regional problem (energy conservation).

That is what we were charged to do. I had the responsibility of organizing a management system to get it done. What were the major influences on organizing the management system? First, I was influenced by the GAO Report on the California Four Cities Program - that should be reviewed every year by all of us. Senator Pell, when he announced the formation of the Innovation Group three years ago in Newport, said: "New England does not need another study group or coordinating agency - it needs a problem-solving agency." And finally, we were influenced by Don Price's book, **The Scientific Estate,** which suggested the marriage of the politician with the scientist, that Mayor Cianci made reference to.

What have we found out after three years? We submitted findings to NSF based upon the New England experience. The following are the institutional, economic, psychological, and political constraints to establishing a regional intergovernmental science and public technology network:

1. The needs of local governments are diverse and their ultimate solution depends upon an intergovernmental approach. We deliberately tried to include on our Policy Development Committee both state and local government types in order to reflect the intergovernmental system of shared responsibilities we all live in. The California experiment began with nine city managers. We felt it was important to experiment with local and state participation.
2. In New England, staff and financial shortages in local governments are really tough barriers. Who has time to talk to you? I think the northern New England area is typical of this sort of thing-a lot of part time officials. Mayor Cianci's Vice Chairman is a part time official from Chelmsford, Massachusetts. Chelmsford has 13 separately elected boards and commissions and over 200 elected or appointed officials. No centralized personnel, nor centralized financial management exists, and Bill Murphy tries to survive in that environment while working at Raytheon and serving as Vice Chairman of this Innovation Group.
3. We also found the short-term focus of the elected official, like Mayor Cianci, versus the long-term objectives of an organization like NSF. We have to blend those two competing views.
4. In New England we found the existing follow-up capabilities of institutions such as municipal associations, state agencies, regional organizations, and federal regional councils are limited, or quite frankly, they are non-existent. The first year I was here I was able to get a work element in the Federal Regional Council's program that said they would monitor the NEIG technology utilization experiment. They dropped that element from their work program over the past two years, so I cannot say that I have been successful in making that organization--established by Federal Executive Order--pay attention to a network NSF is helping establish here in New England.
5. Federal R & D Centers, universities and other resource agencies vary in their understanding as to the role they can fulfill in public technology activities.
6. I found very little incentive for sharing political power or the limited resources that are available to both elected officials and innovation groups.
7. The private sector is reluctant to invest in developing public markets for commercializing science and technology.
8. Information dissemination without implementation follow-through creates frustration among local government officials. I have **not** tried to generate a big image about what a super organization NEIG is, because we cannot reach six states, 1600 local

governments, and 1300 school districts with any real follow-up technical assistance.

9. There is absolutely an absence of a broad-based active Federal program on science and technology utilization directed toward the public sector.

If these are the constraints, how have we succeeded so far? The Policy Development Committee is modeled after Don Price's book, **The Scientific Estate.** We have used, principally through IPA mobility assignments from the Federal Laboratory Consortium, circuit rider technology agents in Connecticut and Massachusetts and to the state legislature in New Hampshire. We have employed program managers in energy conservation and in public works management. We have tried to network, a term which I define as working with existing institutions and resources and blending their capabilities together.

We have some operating parameters. Our style of operation-our management style-as I have tried to direct it, has six components:

1. We have tried to provide person to person assistance.
2. We have tried to encourage existing agencies to take the lead - private industry, Federal Regional Council, New England Regional Commission, municipal leagues, state energy offices. But, that takes time and money and it is the kind of thing we now must reconsider. How much should we go around encouraging existing organizations to take the lead? Usually, they do not have any money to do anything and that brings us down to the adaptive engineering question which is a major issue for all networks.
3. We have tried to network users and suppliers. For example, I visited 70 different organizations before the energy conservation program ever got off the ground.
4. We have tried to avoid one-time situations. I do not think they really have an impact unless it is a dramatic kind of a thing. An example of that would be the problem of lead contaminants in the soil of Boston, Massachusetts, which forced them to shut down their urban gardens program.The Governor's Secretary of Environmental Management did not know where to turn to get the analytical capability to study the amount of lead contaminants in the soil and for some reason the state university had turned her down. Fortunately, the Natick Army Laboratory was able to respond to this problem in a timely way.
5. We have tried to seek permanence, not just quick visibility.
6. We have tried to provide on-going support. The Feds tend to have a demonstration mentality and fail to realize the importance of this type of service. They cannot see the long pull.

Funding Criteria. How do we take the limited amount of resources that we have and try to get more out of them?

1. We try to look at the degree of risk - sharing that is involved.
2. We try to take a look at the timeliness of the investment that we might make which could trigger something bigger.
3. We try to look at the commercialization potential. What does the market look like out there.
4. We try to look at the number of jobs that might be created or saved.
5. We try to look at what the public productivity potential might be.

Finally, what should I be held accountable for? What is the impact of all this? I would like to think that what we are doing, whether it is energy conservation, assistance to the jewelry industry, or fiscal management assistance for the smaller communities in northern New England will ultimately have the following effects:

1. It will impact top decision-makers.
2. It will be integrated with something called a planning process that helps a local official think about how to get from here to there.
3. Most importantly, it will be linked to the budget process. We want science and technology to influence the allocation of public resources.

We have had some experiences with the jewelry industry over the past 16 months. It took us until about 1:10 p.m. yesterday afternoon to get $60,000 out of the federal government to deal with the jewelry industry problem. Ultimately, if we are successful, this program will influence 100,000 jobs in this country and about 30,000 of those 100,000 jobs are within 10 miles of Mayor Cianci's city hall. The jewelry industry is a significant economic force in this region and I do not find anyone from the Sunbelt coming up here trying to woo the jewelry industry down to North Carolina or Georgia.

Another experience involves Bob MacDonald, our first technology agent in Connecticut. He tried to implement a $250,000 NSF-funded snow removal demonstration project. He organized 33 communities and then the project went "belly up" due to lack of implementation funds from any other Federal agency. I want to change that. I want to be able to implement a snow removal routing demonstration project that already has in it $250,000 of NSF funds and is needed by a large group of municipalities.

As for public works management assistance, we are trying to take an NSF report, developed for the American Public Works Association in 1975, and the Navy's public works management system and PTI's vehicle maintenance system, and have these adapted to the needs of nearly 50 municipalities. We are absolutely dead in the water. I think I have done my job, but I do not know how to get the other part of the network (the Feds) to respond. But that is the sad side of the NEIG story and the rest of this presentation has to do with a success.

This success story began at Estes Park, Colorado, at a Federal Laboratory meeting in October, 1975, when we decided introducing thermography to New England would make sense. I "bootlegged" $7,500 out of our $60,000 NSF grant to launch our program. NEIG's energy management program is now functioning in capable hands and beginning to make an impact, as a contribution of science and technology, to the needs of an often neglected sector of public officials - the school administrators.

At this point, I am going to stop so that we can demonstrate how a networking process really functions and what it looks like. Dr. Richard Munis is on an IPA mobility assignment to NEIG. He has been our energy conservation program manager for about a year. Dick, pick it up from there, please.

Remarks of Dr. Richard Munis

I am glad Bob brought out the problem of how to use this knowledge because for a while we were very frustrated. About five years ago, at the National Bureau of Standards, we developed an engineering technique to use infrared thermography to detect heat losses from buildings. It is very neat technique - it works very well - it is mostly qualitative; it can be quantitative, but it is a very objective analytical technique. We did this in response to the Arab oil embargo. The prices of oil and gas were going up and people were panicking, so energy conservation became a big item. So we developed this technique at the Cold Regions Laboratory, and we spent a couple of years surveying over 100 buildings. We wrote four reports. We were preparing four others and all of a sudden we looked around, and said, "What good is this information? Who is going to use it?" It was going nowhere. Scientists and engineers were calling to ask how do you guys do this - what equipment do you use - when do you do it, etc. But, beyond that, it was going nowhere.

I think it was one cold day in March 1976, when Bob Cox showed up on the scene with the Innovation Group concept, and lo and behold, here was a mechanism by which we could begin to disseminate this information that we had developed through the research program at the Cold Regions Laboratory. Bob began working on the problem of seeking user needs for thermography. Bear in mind, we were in the infant stages of the program. We had thermography, but that is all we had at that point. But Bob worked with state officials, Speaker Roberts of New Hampshire, and school officials in Warwick, Rhode Island, and the Innovation Group sponsored two demonstration projects in Concord, New Hampshire, and Warwick, Rhode Island, where we did thermographic inspections of the buildings. These were at the state capitol of New Hampshire and at the Harold Scott School in Warwick, Rhode Island. We began pulling together a game plan - it began to lead to bigger and better things. We did this in cooperation with the Cold Regions Laboratory. We did not have the funds at the time to buy an infrared camera system which costs around $40,000. We worked with the Cold Regions Laboratory using their equipment and personnel.

Thermography is just one part of what I like to call an energy management program. There is a vast difference between having an objective, analytical technique and an energy management program. We have begun to incorporate this technology into an energy management program. The approach we are taking is the ground-based approach. We are not using airborne thermography. That is a good public relations tool, but when you get into analyzing buildings, you have got to get into the nitty-gritty, you have got to get down there on the ground, with a piece of equipment that can look at a building and tell you all the things you need to know about a building. This is no simple matter. You are looking at different types of heat losses. This is all part of our thermography inspection program. We began to ask ourselves "what do the users, the local public officials, need out there to help them?" Obviously, thermography by itself is just not enough - we have got to go into a full-scale energy management program. So we began putting together a program whereby we offered the service of coming into a community or school district and doing a complete energy management study. This means analysis of the heating system, building shell analysis, a roof moisture inspection and it means doing a pay - back analysis - a before and after - and also prioritizing heat loss.

As for the heating system in houses, we can tell, using infrared thermography, where and when a building is being overheated, whether the controls are functioning, even before walking inside that building. This leads to the expert who comes in and does the heating system analysis - he can focus his attention on that part of the building needing the most attention.

The building shell analysis - the walls, windows and roof - we do this with the infrared camera system. We take thermograms (heat pictures) of the building. We analyze them. With thermograms, you can show public officials various heat losses in their buildings and they respond quickly because this is a positive documentation. But we go one step beyond that - we actually analyze the thermograms. From the analysis, we can on a qualitative basis say which heat losses are the most significant in a building and if there are several buildings involved, which buildings should be looked after first. We have gotten confirmation of this through heating cost analysis also.

We did our first program in Barrington, Rhode Island. Here is how the process works. We go in and look at the cost data - we tabulate what has been causing the consumption for heating degree days - consumption per square foot. We look at the architectural drawings because we have got to understand that building, how it is used, why it is used and when it is being used. So you can see that the thermography is a very good first step, but it is only part of the whole program. We put all this information together - we then go up on the roof of the building. Infrared thermography very lately has been used to locate wet insulation - wet roof decks - that you cannot perceive with the eye. Many larger buildings and schools have flat roofs. Although the architect designs them like he thinks they should be designed, when in fact they are constructed, they are not constructed properly - they very seldom slope toward the drain. Water, puddles on the roof, snow gathers. The roof begins leaking. With thermography, we can do an objective and documentary analysis of the roof and say "Okay Mr. School Official, Mr. Mayor, this is the situation with your roof. You need not replace the whole roof, even though it seems like it is leaking in many places

- there is only one section that actually has water damage."

Then we put together the pay-back analysis and this whole thing becomes our energy management program. We then can and will be doing shortly in fact, a redocumentation of the situation after retrofit to a building has been done. We make suggestions for retrofit - we try to itemize in as many cases as we can, the cost of the retrofit and payback and then we tell the local community official, "okay, once you get this work done, we can come back with the infrared camera system and document how good the retrofit is." This is extremely important because all your payback periods that are calculated - which is one reason why I am a little skeptical about payback periods - are calculated on the fact that the work is going to be done perfectly - caulking, weatherstripping or roof replacing - will all be done with absolutely no problems.

Now I would like to introduce Bryant Pake, of the Berlin, New Hampshire, Community Development Department. He is a town planner in Berlin. He will tell you how they plan to use the kind of services that the Innovation Group provided them.

Remarks of Bryant Pake

Thank you Dick. Berlin, New Hampshire, is located 180 miles north of Boston and 50 miles south of the Canadian Border in the heart of the White Mountain National Forest. Berlin owes its existence to the paper industry, employing nearly 15 percent of the total population of 15,000 residents. Berlin, a relatively cold region of the country, has an average temperature of 33.8° F.

The Berlin Community Development Department has been instrumental in establishing an Economic Development Office, a downtown revitalization program, a small cities rehabilitation program, and a housing assistance program.

My involvement with N.E.I.G. evolved through the Housing Assistance Center energy conservation program element. My objective in implementing the energy conservation program was to research energy conservation methodology and subsequently provide technical advice founded upon sound conservation principles. Conservation advice - seekers included individual homeowners, community development staff program managers, local industry and local non-profit organizations.

The more comprehensive my energy conservation research became, the greater disparity and conflict emerged in proper construction priorities and methodologies. The insulation industry spokespeople urged more insulation and presented color charts pronouncing various fixed percentages of excessive heat loss experienced through ceilings, foundations, walls and windows of typical houses. The message - more insulation is better.

The HUD area office in Manchester, New Hampshire, offers different advice: 60 percent of building heat loss is through the roof. Insulation of foundations in Berlin is **not** recommended due to frost heaving.

The Governor's Council on Energy suggests another approach: the walk-through audit relying upon visual inspection alone to structure retrofit priorities.

As you now see, that leaves the Berlin energy conservation resource person in a dilemma: How do I recommend an individualized energy management program when the term "energy management" eludes consistent definitions? Consequent prescriptive diagnosis and treatment of the energy-dysfunctioning organs could not begin.

At this point, I became aware of an innovative approach to analyzing excessive heat loss. Infrared thermography was previously known to me in its military application, and I assumed it now was confined to a top security laboratory, never to be heard from again. Thanks to the New England Innovation Group, that technology emerged from the laboratory confines and served as an energy management tool for initiating conservation measures worth tens of thousands of dollars to the taxpayers and building owners of Berlin.

The application of underutilized technology to Berlin's municipal problems is but one aspect of innovative problem solving addressed by the NEIG Policy Development Committee. It is my understanding that this committee is constantly grappling with questions of technology services delivery with the goal of adapting and improving upon a system having the potential for even greater development and growth.

Summary of the Remarks of William Jones

William Jones of the Energy Laboratory of the Massachusetts Institute of Technology, and a member of NEIG's Policy Development Committee, was then introduced. He discussed the structure and some of the activities of the Committee. Mr. Jones then described an infrared imagery demonstration project recently conducted in Massachusetts. As a result of the success of the project, similar efforts are being funded in other areas of the country. Mr. Jones emphasized that this was networking in action. The results of new technology application in one region, New England, flowing out to be used in other regions. He said he hoped New England could in turn benefit through the networking system from successful technology projects being sponsored by the other innovation groups and local government networks.

SCIENCE & TECHNOLOGY NETWORKING: LESSONS WE HAVE LEARNED

Remarks by J. David Roessner, *Senior Policy Analyst*
Solar Energy Research Institute

It is interesting to come back not as a member of the crew anymore, although I would like at least to indicate that although my new job says "solar energy," I have not really left the intergovernmental science and technology area at all. I am concerned with the same kinds of issues and doing the same kinds of analyses, but now focus on solar energy. Here, I want to do pretty much what Bob has suggested that I do, and that is to see if I can summarize some of the findings of empirical research that our office at NSF funded over the last four or five years. In so doing, I will present first, a structural picture of what the innovation process looks like in local government - how are decisions made and second, what factors influence those decisions - what particular factors that we have identified in that process seem to have relevance to the question or issue of networking; and finally, a discussion of some of the ways in which networks now, or might in the future, perform functions that interact quite directly with that decision-making process-the process to reject or adopt and implement innovations. By networks, I mean sets of communications channels which are institutionalized. They contain technical information - the type we are talking about here - and they link sources, intermediaries or change agents, and users of information. In addition to these channels are particular senders and receivers which you might call facilitators. Of particular interest to the NSF networks are the receivers, frequently labelled technology agents or some other appropriate title.

Let me move directly into a quick picture of what the local government innovation process looks like. You can use lots of labels; it does not really matter so much what the labels are as long as you get a sense that a series of activities is occurring over time. First of all, there is the agenda-setting or problem identification period in which officials try to sort out what the problems are and perhaps to search for and adopt solutions. The search comes after some kind of agenda setting or problem ranking activity occurs. There is a period where potential solutions are matched to existing problems. Then comes a period of formal adoption in which budget line items are identified and passed by the city council, bond issues are authorized, and so on. That is the formal commitment of resources. There is an implementation period during which, after the money is committed, the process of bringing the innovation into everyday practice takes place - often a long and tortuous event, as most of you know. And finally occurs a stage called by some researchers "incorporation," in which the innovation is no longer innovative. It becomes part of the routine practice of local government activity and is no longer recognizable as an innovation. Now within that crude picture of how the process of decision-making on innovation takes place, I would like to focus on three particular kinds of features of that process. These features have emerged as a result of some half-dozen or so studies of this process that have taken place over the past four or five years. I might mention particularly the names of some of the authors who will be familiar to you: J.D. Eveland and Everett Rogers; Robert Yin of the Rand Corporation; Irwin Feller at Penn State; Harry Lambright, Syracuse Research Corporation.

The first feature of interest is the key role of what can be labelled an "innovator" or "bureaucratic entrepreneur." The second feature is the apparent shift of influential factors from those external to the innovating city and agency in the early stages of the process that I just described, to an increasing influence of internal factors at the later stages. The final feature is the question of the influence of the innovation's technical performance characteristics, as opposed to organizational or bureaucratic or political factors, on the ultimate success of innovation. Let me take each one of these in turn.

First, let us look at the innovator/entrepreneur, who has been identified as a key individual in assuring that innovation finds its way from the initial stages all the way through ultimate success; which means it is incorporated, functioning, it is producing services, it is improving cost operation, or whatever. First of all, this is a role that is played not necessarily by one person but possibly by several persons over the course of the innovation process that I described. There are several important activities of the innovator. He brings information into the organization. He develops internal support within the organization and he helps promote the conditions for early use of an innovation. He provides linkages between the stages of innovation that I described; for example, he matches solutions and problems. There are frequently multiple problems, as you know and multiple solutions. He serves a matching function. He builds coalitions at stages along the process around the innovation in order to provide support for it. In cases of successful innovation, the innovator/entrepreneur tends to be located within local government, not outside it, and is usually either the head of a line agency or the immediate subordinate in the line agency. I might mention that most of the research I am talking about is in cities larger than 50,000, so these generalizations hold for medium-to-larger size cities. The innovator blends technical and professional judgment - he has political skills. To sum up, the innovator/entrepreneur knows how to get things done in local government, and by virtue of his or her background or interests, is linked in some way to the scientific or technical community.

Now to move on to the second feature — namely, the apparent shift of influence from external to internal factors. It seems that, as most of you recognize local officials live in what might be described as a constant swirl of problems and solutions - the salience and priorities of these problems and solutions are constantly changing as a result of the immediate situation. What happens with respect to the initiation of an innovation process is that there is some kind of an external threat or opportunity which causes the agency to raise the priority of a particular problem and press for its solution. Now by threats or opportunities, I mean things like the New York State Legislature passing a law that the work week for firemen shall be reduced from 48 to 42 hours. An opportunity might be the announcement of an LEAA categorical grant program. Another might be the appearance on your doorstep of a salesman with a new widget. These are fairly obvious, and yet I think it is important to note that there does have to be some kind of an external threat, opportunity, or something like a trigger. There are rarely any conscious, rational search procedures once a problem has been raised to a high level of priority. The search for a solution is incremental rather than synoptic. The criteria for acceptable solutions are heavily weighted by the immediate context, by events, by personalities, by perceptions and positions of the top administrators and by the ease with which alternative solutions are perceived to be implementable. Under most circumstances, bureaucrats rather than elected officials are the key actors in technological change in local government. Politicians usually react to the initiatives of persons within the line agency bureaucracies. To put it a different way, technological innovation in cities is a bureaucratic process: bureaucratic politics rather than partisan politics.

Personal contacts and influences, communications, and support are significant at the early stages of the decision process, when agendas are set and problems and solutions are matched. At this stage, the professionalism of agency officials counts. It counts because of the extent of contact with colleagues in other cities; the more professionalized agency officials are, the more likely they are to have contacts with their colleagues via professional meetings at the national and regional levels, to read national journals, to read trade magazines, and so forth. Also at this stage, intergovernmental linkages are important for seizing opportunities, for seeking support - dollars or otherwise - so that this stage is an outward reaching one. The greater the extent to which officials are linked to that outside communications set of networks, the more successful they are. I might mention that the "quality" of these intergovernmental support mechanisms varies tremendously, depending on the functional area of local government. The usual success story is the highway or traffic area, which has a very highly integrated network of communications including federal, state, local and inter-state and inter-local. One can characterize the solid waste area as one which lacks this kind of integration. I will come to some implications of that later.

As the process moves from these early stages of agenda-setting and problem identification through the decision to adopt and concern for implementing innovations, there are several internal features of the organization which become important. The first is certainly the support of practitioners who have to use the blooming thing. Frequently, that means the unions, but not necessarily--individuals obviously can balk at the possibility of introduction.

I might mention a particular finding in one of the studies that I think is pertinent to the networking situation. It applies to situations where innovations are what might be labeled "task-specific" - that is, innovations that can be used for only one function. The jet-ax is such a case, Probeye is such a case, but the computer is not such a case - it can be applied to a variety of tasks. In cases where you have an innovation that basically has one thing which it can do, practitioner support is particularly significant for successful incorporation of an innovation. And, in addition, support or evidence from other communities who have implemented that innovation in a similar setting is equally important. These tend to stand out as primary factors that lead to successful incorporation.

Finally, what about the relative influence of technical versus what might be called bureaucratic factors in successful innovation? Let me review a couple of findings. Yin at the Rand Corporation found evidence in his 140 case studies of innovations in local government that there may be two processes involved in innovation. One of them is oriented toward the improvement of local services - this seems to be the driving force and one could associate outcomes with efforts and variables related to cost effective measures and the standard kind of improved quality of service delivery. There is another whole set of variables that are bureaucratic in nature. They have to do with prestige, with local support, with larger budgets, larger staff and the usual things that one thinks about that are the indicators of bureaucratic performance. They are both important. They both lead to innovation. Lambright, in another study, found that if you compare what he called service efficiencies with cost efficiencies, in other words, if you compare the importance of promises of improvements in services with the promises of cost efficiencies (I stress "promises" because there does not necessarily have to be evidence of it - it is the success with which these arguments are employed that brings about innovation) it turns out that service efficiencies or promises of service improvement are more predictive of success than are cost improvements. In other words, the quality of service seems to be more important as a predicter of successful innovation than cost. Both are important, but if you talk about the relative weights of the two, it is service improvement that counts. And finally, in another study, Robert Yin observed that practitioner support is gained by paying attention to **their** values. Frequently the values of practitioners and unions are not those which are used by external evaluators such as cost effectiveness and standard things that federal agencies like to think about when they are promoting an innovation. What counts in implementation are things like convenience, safety, lack of threat to jobs; so that in order to get an innovation through the final stages where an innovation is performing its functions within the line agency, one has to take account of the fact that a) practitioner support is necessary, and b) is achieved by attention to values which are not often those used by external evaluators.

Now what are some of the implications of these findings for networks and, I might add, some challenges? There are some implications but I think I'll pose many of these in the form of questions. The first derives from the fact that the innovator/entrepreneur is a key receptor, or at least potentially a key receptor, in any kind of communication network. But the innovator/entrepreneur is frequently a part of existing line agency communications structures that rarely cross functional lines. What you see is a vertical system, with local, regional, and national mission agencies linked together with varying degrees of success by professional associations and public interest groups at the line agency level. One might then, raise the question of how technology agents, the manifestation of NSF networks, relate to the bureaucratic entrepreneur and his professional network which focuses on line agencies. How can networks best inject and promote technological innovation as one of the solutions to the problems that continually swirl about in the heads of local officials? How can technology agents and the NSF networks provide support in areas where the line agency or functional networks are weak, as in the case of solid waste?

Second, it seems that the NSF technology agent network is well-situated to facilitate what might be called the front end of the innovation process in the local government. But one might ask how it can assist in the latter phases where key actors are internal to the jurisdiction rather than external, and the key factors for success seem to be internal. Also, is the network sufficiently sensitive to political coalition - building problems that seem to be essential for local success in innovation? Should networks be sensitive to these coalition-building and political factors or should they stick more to science and technology?

Third, how can the networks deal with the problem of "technological bias?" Bias might be a little too strong a word, but the point is that the networks that we are here to talk about today are based on the belief that science and technology are desirable solutions to local problems. I do not think any of us question that; however, it means that what goes into these channels and what comes out of them has a science and technology bias which implies concern for technical performance. Often engineers are involved, who are sensitive to and worry about technical performance characteristics. However, as I have pointed out, that is only one kind of thing that matters in local government innovation. To what extent can science and technology networks explicitly and legitimately recognize some of the bureaucratic factors that influence successful innovations? And should they?

Finally, should the NSF and the federal government take the decision process which I have described as a given, work with it, try and inject information into it, build a structure around it, or should it explicitly think about altering that system in some way? One might ask, for example, since bureaucratic entrepreneurs in medium to large-size cities exist in line agencies, what kind of a network system should one design to bring in technological innovation? One can think of PTI-like organizations which are national in scope or one might think about strengthening existing line agency networks which, as I have pointed out, vary from strong to weak. Hopefully, these remarks will generate at least a few thoughts. Thank you.

SCIENCE AND TECHNOLOGY NETWORKING: LESSONS WE HAVE LEARNED

Remarks by Joseph N. Baker
Vice President, Public Technology, Inc.

Several weeks ago I contacted Jim Linenberger to discuss my participation in this meeting. Jim informed me that David Roessner would pursue the subject of "Lessons We Have Learned About Science and Technology Networking" from a theoretical standpoint; that I should discuss the subject from the perspective of a practitioner and that Don Borut acting as the synthesizer, would bring the theoretical and the practical approaches into sharp focus.

I was pleased with my assigned role because the subject of technology, the transfer of technology, and the mechanism which we have to carry out this process have been prominent in my thoughts due to the fact that I had to prepare a presentation on "Making Less Do More Through Cost Saving Technology" for the Mayors, City Council Members and appointed officials in attendance at the annual meeting of the League of California Cities.

I concluded my remarks to that group by reading from an activity report submitted by one of the Southwest Innovation Group's Science Advisors. Even though this is a different time, a different place and a different audience - I think the remarks contained in that report are as appropriate in Newport, Rhode Island, on Thursday as they were in Anaheim, California, on Tuesday. I hope you will agree. Let me quote directly from that report.

> "...Regional and national networks are over-emphasized. After five or six years of funding this project (SIG, Four Cities or what have you), it should be clear that mailing the good ideas or "innovations" around the country and going to a lot of meetings is the easy part and it doesn't usually solve the problem. You can't solve a math problem by laying a math book on it."

He continues:

> "95% of my time is spent in:
>
> a) Finding an open-minded department head willing to listen.
>
> b) Getting the necessary commitment from the CAO to go with the project.
>
> c) Developing a plan for implementing the project.
>
> d) Assisting in getting it implemented by doing some of the administrative work and cutting across department lines, and
>
> e) Doing anything else legal and not against my moral code to get the job done."

He goes on:

> "Perhaps many of these activities weren't in the original thesis of this NSF Project, but I thought that the goal of the project in the final analysis was to help cities solve some of their problems and improve productivity regardless of whether one uses "space age technology" or not. Around here you can't get results by tossing a tech brief out on a department head's desk. You have to get involved.
>
> In addition, it appears that the potential for local networking has been largely ignored in favor of the more impressive sounding regional or national networking. Local networking refers to cities and counties in close proximity to each other. Being in the same State and sharing a political situation or having a similar weather condition is of an immense advantage in sharing innovations.
>
> One other issue is that of city funding. Consistent with the original concept of this NSF Project, it is often argued that if the cities are receiving a service from the Science Advisor they should now pick up the tab.
>
> Well, that's fine in the perfect world where concepts are born but perhaps it is time to

> stop thinking of CIG as a project and treat it as a program. There are many Federally funded programs from which cities accept funds, and if the dollars were removed the programs would cease.
>
> In the brief time I have been involved with the California Innovation Group, funding has gone from 100% to 40% to zero for next year.
>
> With the passage of the Jarvis-Gann Initiative, California cities and counties are under heavy political pressure to cut positions that don't sound like police or fire. Science and Technology Advisor doesn't sound like anything anybody has heard of before. What about "Change Agent"---"Do you have change for a five dollar bill?---They give you $20,000 a year for doing this?---"

He concludes his report with:

> "I am fortunate that the City Council, in the midst of severe personnel cuts decided to retain my services for an additional year based on my past contributions to the City's operation. I have also been candidly informed that my job is like a baseball player. I may have batted one thousand last year, but each year I start from zero. It's damn hard to save a city $100,000 or more every year - year in and year out. The lighting project took over a year.
>
> I am grateful for the opportunity I was given in the past to carry out this type of work and the opportunity afforded me by the extension of my contract. I hope to continue beyond that, based on merit and not on the inertia of the position. However, some Federal dollars would certainly help insure that continuance for myself and for my colleagues in the California Innovation Group.

With appreciation for past support.

Sincerely"

Those thoughts point to the practical aspects of dealing with technology in a local government environment. What impresses me is the concern he voices on how to better access the market - the Department Heads; and, if successful in that, he questions how to impact the next city. It is obvious to me that he is asking for help to better achieve these goals. Could it be that we have placed too much emphasis on the process while not paying enough attention to the participants? While we are dealing with less than 1% of the market - what is the other 99% doing? Have they been excluded by omission? While the exclusivity of belonging to an innovation group and to be known as an innovator or an early adapter is one of the strengths, and yes, one of the attractions, it also could be that those strengths are also one of our greatest weaknesses. It is my belief that in order to achieve our goal, participation of local officials must be expanded. The national needs must be solved at the local level by local officials.

I am not disagreeing with what was discussed at Burlingame nor at Little Rock. I read the proceedings of the first and the second annual innovation group conferences and each conference expands on the need for and importance for networking. This is a valid and necessary objective! However, the trap which we have allowed ourselves to fall into is that we continue to discuss, and yes, re-discuss, these topics with the same audience. During the past two years we should have expanded our market; we should have involved many more practitioners in this effort.

One recommendation which we should agree upon is to devise a plan on how to better impact the market place. Since each local government network, each regional or state innovation group is structured differently, it appears to me that the marketing approach must vary. Also, the standards of performance and the expectation level among local agencies vary, as well as the real and perceived needs of local government as defined by their officials. Other variables which have an impact on the marketing strategy are the size of the community and its climate. Also, is it a center city, a suburban community or a rural town? What are its ethnic or racial characteristics? Is it primarily an industrial, commercial or residential community? What is its level of affluence? These are the questions which an innovation group must be aware of if that organization is going to be successful in enlarging its clientele base. So, as Dr. Roessner stated, these criteria are somewhat different from those used by the Federal Government in evaluating whether an innovation group is successful.

I would suggest that element number two Data Base, and element number three - Communications, as described in the Blue Book, be combined into a new element titled "Marketing." I liked Dave's term of "innovator entrepreneur." It fits! This modification would better describe the activities related to bringing the knowledge of benefits accruing from the adaption and adoption of new technology to local government officials. A marketing program dealing with technology and its applications within the local governmental field would itself be experimental. In addition, such a program would be unqiue because of the clientele - local government officials. The marketing concept has not been utilized by the technical service organizations which have local government officials as their clientele. I believe it is time we availed ourselves of this technique - that the adoption of marketing technqiues would in itself be an innovation.

It is my opinion, based on my experiences in the public sector, that a nationwide marketing program would be most effective if coordinated by a single organization with the regional and state innovation groups playing a prominent role in the implementation phase. Finally, it is my belief that if we are to be successful in this total endeavor, not only must local government officials understand what we are trying to accomplish and the benefits to be accrued from a technology program, they must also be involved in the process in a meaningful way. I have discovered that mayors, council persons, city managers, chief administrative officers, and citizens want to participate in this process. They do not want to only be the recipient of a solution, but rather they want to contribute to the solution of the problem first and be a recipient second.

As I studied "Building A National Intergovernmental Science and Technology Network" (the Blue Book) I found the emphasis to be on the concept, the process and the procedure. The human factor - the user is not given a prominent position anywhere within the overall program. As a practitioner, and as a former member in an innovation group, this de-emphasis on the role of the individual participant distresses me. Therefore, I would like to add yet another element for discussion purposes - let's call it "User Development."

The sub-goal of this element should address the need for undertaking a program to involve municipal officials, elected and appointed generalists and specialists - management and labor - in the technology movement. This program should be designed to show the role technology can play in reducing the costs of government services; to show how technology can increase productivity; to show how technology can provide government employees with a safer and better working environment. Let's transfer the emphasis from the network, one to the other, to the client, and in so doing bring the work of the innovation group closer to the local government official.

So, from a practitioner's perspective, I would agree with the comments of the Science Advisor who was quoted earlier, that in effect "too much time is spent trying to find an open-minded Department Head willing to listen" and "getting the necessary commitment." These tasks can be achieved in a more cost effective manner if we utilize the skills and expertise of the local officials to guide us in providing services and programs from which they can profit. This approach will help to assure the success of incorporating new technology at the local level, and in so doing strengthen and increase the moral and economic support at the national level for this program.

I now leave it to Don to put Humpty Dumpty back together again.

Thank you.

SCIENCE AND TECHNOLOGY NETWORKING: LESSONS WE HAVE LEARNED

Remarks by

Donald J. Borut
Director, Management Development Center,
International City Management Association

Information networks in local government are not cold, impersonal communication linkages, rather they are relationships based on confidence individuals have in one another. For networking to work, individuals must trust and be willing to take risks with colleagues working in other local governments who may be in a position to provide assistance. Those active in the local government network process must also be conscious of the needs of the different actors as they relate to their own organization or institution. In brief, we must be sensitive to the constraints of the political world of local government, and of the world of the multiple local government networks.

I would submit that networks, the linkage through which information is shared, are built on personal relationships and trust between individuals in local government and those who facilitate networks, e.g., public interest groups and between colleagues within the networks. Second, the science and technology network which has been building over the past few years is cross disciplined, which is one of its strengths and also the potential seed of its weaknesses. Third, information that is transferred through the local government networks must be a combination of both best practices and state of the art activities. The former cannot be overlooked since it is the most critical source of information sought out by local government practitioners.

My own frame of reference is that of the public interest groups, having worked for the past seven years with ICMA. The public interest groups, the Big Seven and the functional public interest groups, such as the American Public Works Association and Municipal Finance Officers Association, all represent groups within local government and thus have a basic constituency for which they were created and to which they must provide service. In each case, the public interest group serves as a vehicle for supporting a special network within local governments, whether it is city managers, public works directors, municipal finance directors, etc. Each of these groups, and I speak very personally in this instance, is very protective of its constituency, since it is the basis of the existence of each of these groups. Each constituency, for example, police chiefs, finance directors, or city managers, has a common experience, and thus a basis of trust and sharing with one another.

Over the past five to ten years, this basis of trust and sharing within each constituency has resulted in what I perceive as a significant change, namely an increased inclination to share information between practitioners and to avoid the "not invented here" syndrome, i.e., the assumption that the program or approach developed in one community would not be applicable in that of another individual. In brief, local officials have opened up with one another and are much more inclined now than in the past to take risks and share not only program ideas, but areas in which there are problems for which a person may not have a solution or may be quite anxious about.

Within these disciplines, many informal networks have developed, either on an area basis, state basis or regional basis, through which a great deal of information flows. Most often this sharing includes best practices or techniques which might be useful to others. It also has the prospect of being a vehicle for sharing ignorance. Let me cite one example. Some five or six years ago, ICMA sent out a postcard to all of its members, asking one question, simply, "when you think of garbage, which one of your colleagues do you think of?" We found that a number of managers were identified as being knowledgeable in solid waste. We also found that many of the individuals who were identified as being helpful and knowledgeable in this field were actually using some of the most primitive practices for solid waste collection. The important point for us, however, was that these individuals were perceived as leaders and knowledgeable in this field and, therefore, were willing to provide assistance. Our role, through ICMA, was to make this group of perceived leaders aware of new practices; we serviced the informal network.

Last year at this conference, Mark Keane noted that virtually all local governments are developing new program approaches. Each serves as a laboratory. The role of public interest groups, such as ours, is to tie these laboratories together to facilitate the sharing of information to insure that best practices are known by other colleagues within a discipline, and to minimize the amount of "ignorance" that may flow through the network.

There are a number of characteristics of the public interest group professional network which I think can provide the basis for understanding the science and technology network which is of critical concern to us. These characteristics include the following:

1. A common discipline and value, whether it is finance directors, police chiefs, city managers or elected officials; there is a common set of concerns, a common set of rewards, and a basis of unique understanding within a discipline.
2. This sense of commonality that exists within the various disciplines provides the basis of special trust between the members of the groups.
3. People within the local government disciplines advance professionally often by moving to other jurisdictions. This movement of people creates stronger ties and a sense of community ties within the group.
4. There is an emphasis on the sharing of best practices. Since all of the actors in the local government disciplines operate in the fishbowl environment, they are very concerned about making improvement and changes that have the greatest prospect for succeeding and minimizing downside risks. Best practices that are in-place and operating offer the greatest probability of being effective in other communities.

In looking at the S & T network against the model I have just noted, there are several points worth noting:

1. The S & T network is not a common discipline. In fact, it crosses the discipline line and the public interest group constituency line which, as I will note later, is significant and is the basis for some potential problems.
2. There is the beginning of a basis of trust between those in the S & T network as witnessed by this innovation conference. Many of us have met three times now and have gotten to know one another better from being together in an informal setting; we have common concerns and common interests.
3. There is a movement of people within this S & T network. Jim Lynch, for example, has served as the science advisor in Little Rock, and is now serving as the Director of the Pacific Northwest Innovation Group. Joe Baker, my colleague on this panel, has served as the city manager of Burbank and is now with PTI. Much of the staff of the ISETAP panel is made up of folks on assignment from local government.
4. In terms of the focus of this network, at least in literature that I have read and at this very conference, the emphasis has not been on best practices, but rather on state of the art. This I would submit is not the reality of the lives which each of us must live in local government, but it seems to be the basis of the intellectual ferment that comes through the written work and the

research that has been studied by my other colleague on this panel, Dave Roessner.

Now for the dilemma. The paper that will be the ultimate focus of this conference proposes to create an S & T network similar to that of city managers, police chiefs and finance directors. The problem is that this network crosses disciplines. It is an amoeba growing over the disciplines and networks that many of us have been responsible to build and service. To be blunt, this can be enormously threatening to those of us that serve existing networks.

My colleagues and I from the several public interest groups operate on a basic premise, namely, don't screw around with my constituency. I am protective of it, and if I feel that another group is interceding between, for example, city managers and the city management association, I can get very squirrely. Perhaps, this is not the way it ought to be, and in all likelihood my colleagues and I in groups like ICMA, should be more open to the total flow of information. But the fact is that organizations like mine are very human; they are made up of people who have feelings, who have objectives; we operate on the basis of human fears and human joys. When we feel threatened, we feel anxious, and when we get anxious, we don't act in ways that are conducive to sharing information. I would submit that the creation and growth of the S & T network crosses the functional disciplines of local government, and those involved in them must be more sensitive than they have been in terms of relating to local officials.

My personal concern is how we can create an S & T service organization, PTI, that is supported by the public interest groups, the innovation groups, and any other networks that currently exist, without creating felt conflicts through overlapping services. To be successful, several conditions must exist. There **must** be a trust between those who are servicing the network; that is, there must be a trust not between organizations, but rather between the individuals in the organizations. It is not the National League of Cities and ICMA that have confidence in one another, rather the directors, plus the staff members, who know one another and, therefore, have built relationships of trust. I would define trust as a willingness to be open and take risks with one another and not fear that such openness will be used against us.

In addition, for a good working relationship to exist, there has to be the identification of ways that both networks can benefit from the sharing of information. That is, if PTI provides information to local governments through city managers, then I must recognize and feel that in that process ICMA is not perceived as being ineffective, but rather a support to PTI and thus it too receives recognition.

Finally, there must be an open understanding and agreement on the differences between networking organizations. Simply put, there will be areas where two organizations, such as finance officers and PTI, may overlap. Where that exists, the representatives from the two organizations must talk to one another and understand and recognize where these overlaps are taking place. They cannot simply pull back and build suspicions, which in themselves can be very destructive. I would note that in the past this process has occurred and the anxieties developed have been most dysfunctional.

We are now at a very critical stage in terms of the development of an S & T network. Because of the efforts of the National Science Foundation, both through its financial support and the holding of meetings such as this one, our S & T network is growing and a lot of individuals from different levels of government are beginning to interact and develop trust. The key issue is how those of us in this network relate to the functional disciplines. Unless we can find a way of developing mutual dependencies, this network will, I would submit, by the sheer bulk of the other disciplines, be boxed out. I am sure each of you can identify instances where this problem has occurred. For example, if the American Public Works Association staff which is a strong and rich group, feels that one of the innovation groups is moving in on an area that has traditionally been theirs, they will get very anxious, as I would submit they should. Therefore, there has to be a reaching out between and among these groups to insure that

that does not occur.

My thesis is that individuals must build confidences and those confidences must be built off of the concerns that exist within disciplined groups. These relationship issues may seem petty in light of the real problem - solving objectives of those who we will serve, namely the person in local government on the line who must deliver the services. However, unless these potential interpersonal conflicts are addressed, we will have a subrosa, subsurface turf battle that will close off the flow of information and, in fact, provide the basis of a self-destructive network rather than a growing, expanding one.

My own belief is that by opening this issue up as I have tried to do today, it should be easier for us to talk about this problem and thus bring about the changes that are necessary to improve the relationships between networks.

LINKING THE SCIENCE & TECHNOLOGY NETWORKS

Summary of the Remarks of

Bruce Talley, Associate Director
National Association of Counties

Communications is the necessary and appropriate emphasis area now that a number of institutional bases have been established through NSF's Intergovernmental Program. I am comfortable in perceiving that R & D and information dissemination each has a stand-alone value. In our linkage thinking, we must be sensitive to a coordinated, hopefully centered, communication system which allows these two areas to complement each other without duplication.

Many problems in local government persist not from a lack of technology, but from a failure to disseminate or apply existing technology, whether publicly or privately generated.

I believe these Innovation Group conferences serve as excellent interim informal information gathering and disseminating mechanisms. They help to build trust and to clarify the various actors' roles.

To digress a moment to some of this morning's presentations, I can appreciate the Mayor of Providence's comments on the need for other federal agencies to be supportive of networking activities. However, I would like to take it further to incorporate Dr. Sanderson's comments regarding this "small, exciting program and how it may continue to be so". I would submit that increased NSF support in the area of Intergovernmental Science and Public Technology would also be a significant indication of commitment to this effort. I hope that tomorrow's proceedings when we discuss the 24 recommendations will further support this thought.

Let me move now into a role as a representative of a Public Interest Group. I'll approach this by outlining what I believe is an appropriate role for NACo in this thing we call "networking".

I believe we have three principal areas of responsibility as a public interest group:

1. As an information broker. NACo should publish "ticklers" - short information pieces which can make our constituents generally aware of what you people are doing and then put them in contact with you for the in-depth technical or training materials.

2. Second, because of our credibility with our constituents, we can serve an appropriate role of "risk encouragement" to help increase the number of jurisdictions which are innovators.

3. Third, we can work to remove barriers which limit access to science and technology resources - for example, working with Congress to open the Federal Laboratories to allow them to be more supportive of NSF and not so much the other way around. Also, we can work to suggest to the Congress and other bodies that there needs to be adequate funding of the Intergovernmental Science and Public Technology component of ASRA.

There are many other activities which can be appropriate for the Public Interest Group, such as providing forums where the R & D network elements can interact with public elected and appointed officials on a larger scale than is currently happening.

As a final note, I would like to cite what I consider to be a fine example of the coordination which can exist. It's a coordination which is being proposed between the Public Interest Groups and PTI with NSF support. Nelson Hoy, Director of PTI's Technology Exchange Program, will discuss this effort being pursued by NACo, ICMA, USCM and NLC with PTI.

LINKING THE SCIENCE AND TECHNOLOGY NETWORKS

Remarks By

C. Nelson Hoy
Research Communications
Public Technology, Inc.

I would like to get away from the microphone, change the pace of our discussion this afternoon, and try to pull together what we've been talking about in the area of communications for the last two or three years. I would like, also, to get away from the discussion of what our problems are, what our needs are, and what our aches and pains may be and to start talking about how we're going to build a good communications program for our networks. I would like, more specifically to talk about what we're going to be doing for the next 12 months and what we hope to accomplish by the time we get together for the Fourth Annual Innovation Group Conference.

We've been talking informally about communications now for at least three years. It became a subject of conversation in Burlingame in 1977, when the first issues raised were in terms of an information exchange, communications, or a clearinghouse. In 1977 at Boulder, Colorado, there were suggestions for the development of a clearinghouse, the development of a hot line service, the development of a newsletter service, etc. At the same time, in the President's Office of Science and Technology Policy, the Intergovernmental Science, Engineering and Technology Advisory Panel was also talking about communications. They were talking about the fact that information dissemination was a critical missing link in the Federal research program from a local government perspective. In the same time frame, our PTI Technology Exchange Program formed a new Steering Committee and we began to address in very specific terms, the problems of communications and the problems of faster response time to local governments and to the networks. Now that we're in Newport, I think it's appropriate to tell you that we're taking our first step forward in this area. We're taking this step because the National Science Foundation is concerned about this problem area and the Foundation is going to help us get started with a planning grant ($118,000).

The NSF Research Communications project, during the next year, will do several things:

1. Focus on local government problems;
2. Focus on research communications - that's the communication of science, engineering, and technological information among the networks;
3. Prepare a detailed program plan so that there will be concrete options written down in detail that we can argue about or discuss at the Fourth Innovation Group Conference; and
4. Present these recommendations to ISETAP, the National Science Foundation and other Federal agencies as approriate

So we hope that this effort will have a real big positive impact for the innovation groups.

We've been talking a lot about coordination and feeling good talking with each other this afternoon so I guess it's appropriate to talk a little bit about the Steering Committee that's going to be guiding this effort over the next year. I think you ought to know that the Steering Committee Chairman is Mayor Chuck Horn of Kettering, Ohio. Mayor Horn is actively involved in many networking activities including the Ohio Cities Consortium, the Urban Technology System, and the ISETAP Panel. Other Steering Committee members will be:

Mr. Don Borut, ICMA
Mr. Dick Eckfield, USCM
Mr. Harold Farmer, Gainesville, Florida
Mr. Alan Harvey, Vancouver, Washington
Mr. John Joyner, NLC
Mayor Dennis Lynch, Pawtucket, Rhode Island

Mr. Carleton McMullin, Little Rock, Arkansas
Mayor Soglin, Madison, Wisconsin
Mr. Bruce Talley, NACo
Mr. Gene Waltz, Indianapolis, Indiana
Mr. Wayne Wedin, Brea, California

In addition, we're going to have two nationally-known consultants to advise the Steering Committee and the program manager. They are Dr. Harry Lambright of the Syracuse University and Dr. Everett Rogers of the University of California.Those two gentlemen were selected with two ideas in mind. One, Harry Lambright has done some innovative work that looks at the innovation process within a local government--that's something we need to understand more about. Second, Everett Rogers is clearly the leading authority in the world on the communication of innovations particularly from the inter-institutional perspective--something else we need to understand.

What are we going to be doing? Our work plan for the next 12 months includes:

1. A comprehensive review of existing literature that deals with innovation, technology transfer, the innovation networks, etc.
2. Studying the practical experiences of the local, state and national networks by discussions with them--i.e., asking your guidance on how to set up the communications program.
3. Developing a series of communications strategies.
4. Asking network participants for their analysis and assessments of the strategies we are developing to be sure they'll meet your needs.
5. Development of a very detailed program plan which will be available for you in written form during the Fourth Innovation Group Conference. It will be in enough detail that the Foundation can go out with solicitations asking for institutions to actually develop the services on a demonstration basis.
6. Recommendations from this effort will be made available to ISETAP via Mayor Horn, Mayor Lynch, and Mr. McMullin.

You might now ask, "what are the communications strategies that we propose to talk about?" We're going to talk about newsletters, product catalogs, application bulletins, clearinghouse services, how-to-do-it manuals, seminars and training, and technical assistance. We're going to ask you to tell us within the next weeks or months what else you'd like to have us look at.

There are two other opportunities that may or may not develop for us in the next twelve months. We've got an interesting venture going with the C.S. Mott Foundation in Flint, Michigan. I'd like to introduce Ward McAllister, Program Officer for the Mott Foundation. Ward is responsible for their local government programs. Ward and I have been talking for six or seven months about a program that we would propose to make available to the networks and the public interest groups. Specifically, we're talking about setting up a local government Technology Exchange Service with these essential characteristics.

1. Telephone hot-line service,
2. Focus on local government solutions,
3. Problem or demand-oriented,
4. Comprehensive information searches,
5. Detailed technical analysis or evaluation, and
6. Results available through the public interest groups and the networks.

The other project we are thinking about is to set up a Buyer's Advisory Service in cooperation with McGraw-Hill Information System, Inc. McGraw-Hill is probably the largest information processing company in the world. We've been talking with McGraw-Hill's Director of Venture Development, their Vice-President of their Information Systems, Inc., their Vice-President of Corporate Marketing and they have made a commitment to get into the local government market place and provide a service. They're interested in talking with us about a Buyer's Advisory Service that would provide local governments with information about fire trucks, parking meters, salt, cement, or any other item that costs more than $2,500 a year. We're talking about a service that might provide standard minimum specifications, comprehensive product descriptions, user evaluations, comparative pricing information, and adaptive considerations. This service would be a comprehensive regularly-updated catalogue plus a telephone inquiry.

What we're talking about with McGraw-Hill Corporation and the Charles Stewart Mott Foundation are speculative ventures. They may not come to fruition in the next year, but they're something I think we must try.

TECHNOLOGY-SHARING AND THE SCIENCE AND TECHNOLOGY NETWORKS

Banquet Address by

Alan Beals, *Executive Director*
National League of Cities

Good evening. I want you to know that I appreciate this opportunity to talk with you tonight about the valuable and important work of the National Science Foundation and the science and technology networks. I'd like to use this opportunity to focus specifically on how these networks can increase their strategic role in developing and sharing the technology that will help local governments manage their admittedly complex operations.

But first, permit me a short digression. I'd like to extend my appreciation to Ken Payne and the Rhode Island League of Cities and Towns for their active role in the creation and support of the New England Innovation Group (NEIG). Also, for their important linking role between NEIG and the local governments throughout the state.

Certainly, Bob Cox and his staff at NEIG are equally deserving of mention for their contributions--not only in hosting this conference and preparing the draft working paper, but also in demonstrating the potential of a multi-state innovation group. Bob, we thank you!

To return to the topic--I am sure you are all familiar with the increasing urgency for using science and technology in the local government arena. Bear with me a moment while I restate this case.

Local public officials, by the very nature of their roles, face an unavoidable dilemma. While citizens' demands for the number and quality of local services and for better living conditions continue to increase, the tax revenues available to fund these services and improvements are growing more scarce--and are even shrinking as a result of such things as inflation and voter-mandated or Proposition 13-style cutbacks. The need, then, is for local government officials to "do better" with the same or lesser amounts of revenues. One way to "do better," of course, is to increase efficiency and productivity in the local government sector. Enter science and technology. Science--in the form of well-founded scientific information--and technology--as technological innovations --can help to bridge the gap between these increasing demands and scarce or shrinking resources and revenues.

As regards the role of the various S&T networks in supporting local governments, the concept behind networking is to support the development of technological solutions to problems common to local government leaders. Some of these leaders are members of one of the several operating S&T networks, whether national, regional, sub-state, or local. The institutional framework which the networks provide allows for 1) a spreading out of both the local political and financial risks involved in undertaking such solutions, and 2) a multiple payoff when several local jurisdictions adopt and adapt a solution pioneered by a peer jurisdiction.

Implied in the conceptual framework and in the operation of the several networks, then, is a cycle or complete loop. This innovation loop, if you will, includes:

1) The local government--the user who defines his research needs, thus insuring that technical solutions for local governments are "client-driven";
2) The network or group which assists in finding technological solutions to address the local government's needs;
3) The application in the local government of the solutions provided; and
4) The diffusion by the network or group of the technical innovation to other local governments--those involved in the networks as well as those who are not involved.

Each one of these four elements of the innovation loop is important to the development of the innovation group in particular and the networks in general.

The main point which I wish to raise involves the institutionalization of S&T networking. As such, it has implications for the current developmental work of the networks. My point is this: Let's not lose sight of the goal of networking in the process of building these networks. This goal, as I see it, is to support an improved quality of urban life for those who live, work and play in our nation's urban environments. One way to achieve this goal through the S&T networks is to assist those local governments affiliated with a network in solving their technological problems--and then making this information available to local governments grappling with similar problems which are not linked directly with a network, All four of those elements of the innovation loop which I have referred to, then, are important in the fulfillment of this goal:

1. local government-derived needs
2. finding or carrying out the R & D for these needs
3. application of solutions in the network-affiliated local government, and
4. diffusion of tested solutions to other local governments.

In my view as administrator of a local government public interest group, it is the fourth element-diffusion of tested solutions to other local governments--on which the successful institutionalization of these networks will depend. For, without moving the tested solutions beyond the "innovators" and "early adapters" in the networks, those governments which comprise the vast majority of local jurisdictions will not benefit from these valuable technology-sharing efforts. And, in the final analysis, the purpose of developing and maintaining intergovernmental science and technology networks is to support the development and adoption of innovative, technological solutions to problems existing throughout the local government arena.

In the half-dozen or so federal initiatives in intergovernmental technology-sharing over the past decade, we have learned several things which I believe bear on the current work of the networks. I will mention some of the more salient ones here.

We know, for example, that the attempt to solve urban problems--or any problem, for that matter--is most effective when it is done as a collaborative venture, between those with the problem and those with access to applicable resources. Problems "solved" out of the local context aren't easily accepted or incorporated back into this local context. Why? Because the local officials haven't participated in the definition of the problem. As a result, it is unlikely that the solution offered will "fit" the problem—or the local political situation. Furthermore, it's a good bet that the local officials' investment in such a solution is low. And, without the involvement of these local officials, who are the "gatekeepers" for implementation by virtue of their decision-making roles, there is no guarantee that the chosen solution will be applied. This information reinforces the first element of the innovation loop—that technological solutions for local governments must be "client-driven."

Second, we know that there needs to be a clear consensus by the local government and the networks on the goals and objectives of the work on a technological problem. This point is really an outgrowth of the need for collaboration mentioned a moment ago. In numerous local government projects where the goals and objectives were not clear or agreed upon by both parties, the result was dissatisfaction with the solutions, and a lack of application to the problem at hand. A corollary to this point is the importance of performing the necessary work on a schedule which conforms to the local government's needs--and, if the government is contributing financial support for the work, within the allotted budget. Obviously, timeliness and cost of a technological solution are also critical to the local government's use of the proposed solution. In review, these factors bear upon the quality of the working relationship between, in this instance, the local government and the assisting group or network--and are therefore crucial to the utility to the local government of the solution proposed.

Third, we know that the solutions to urban problems must be pragmatic--that is, they must be practical and implementable recommendations and options which are tailored to the local political and urban environment.Related to this is the fact that the success of the networks as a delivery mechanism will be judged by their performance--that is, their capacity to deliver practical and short-term results which have a demonstrable impact. Local governments also need quick responses to their problems; their decision to use the networks, and hence, the networks' institutional survival, will be judged by the networks' capacity to respond and assist quickly and pragmatically, with demonstrable cost-effectiveness.

Finally, we have learned not to assume that solutions appropriate for one local government will, on their merits, be picked up by another local government. Correspondingly, we have learned not to assume that once a technological solution has been tested in one site, it is ready for or easily transferable to another site, Technology-sharing involves several things:

1. further testing, for purposes of evaluation
2. documentation of the solution and how to implement it, in order that other jurisdictions may benefit from its availability, and
3. assistance in the implementation of the solution--whether from those in the networks, peers, or others knowledgeable about the chosen technology.

To date, ease of transferring technology from one local government to another has not been a prevalent condition. As those of you here can attest, the field of intergovernmental technology-sharing, at least in this regard, continues to offer a significant challenge.

In conclusion, I strongly encourage the continued and increased application of the resources of the science and technology networks to local governments in general. In this regard, it is important that we all keep in mind the goal of your work--to help local governments improve the quality of urban life--by improving both the administration of programs and the delivery of services. Certainly, the success of this endeavor depends upon how well you support these governments in their increasingly complex operations. Perhaps, too, the viability--if not the vitality--of local government as an institution is also riding on the success you have and local governments demand in this important experiment.

Remarks by

Dr. Richard C. Atkinson, *Director*
National Science Foundation

I have not come with formal remarks, but I do want to make a few comments. Then I'd like to spend some time on an exchange of ideas, because one of the reasons for my being here is to get a feeling on a first-hand basis for some of the issues and problems that you're grappling with.

In the process of preparing for this meeting, I had a chance to review in detail the activities of the National Science Foundation's Intergovernmental Programs. In a sense, the ideas behind intergovernmental science and technology activities have been around a long, time, at least as far as the Foundation is concerned. It's been about seven or eight years since we gave our first grant in this area. I think what's been demonstrated over the last six or seven years is that the ideas are good and that there are real plans for implementing them. The Foundation--in this area of local government--now spends about $2.5 million a year. For the national effort that you've been talking about--and you have a better feeling for that than I have--all I can say is that no group impinges on the Foundation with more direct and vocal comments than this one, considering the dollars invested.

The ongoing activity that you people are involved in to examine needs and try to determine just where science and technology can have its impact is very worthwhile. Your findings will be important inputs into the work of ISETAP, the Intergovernmental Science, Engineering, Technology Advisory Panel chaired by Frank Press.

I also think that the discussions that you're having at this meeting and the re-formulation of the study document, will also be a key wedge in helping make the case for expanded support for intergovernmental programs. As you know, there are some doubts among Federal policymakers as to the ultimate benefits likely to result from these programs. For a lot of you who have been on this trail a long time and who have made the case year after year, I'm sure there's a certain degree of unhappiness at the rate of progress.You've heard too often that "things seem to be going well." I'm not going to promise anything now. I am only going to say that I think the times are right for these ideas.

The current heightened concern about local taxation--as embodied in California's Proposition 13 and similar measures elsewhere--may fit very neatly into this package, because no matter where you stand on the political spectrum, it makes real sense to push science and technology into the decision-making and planning and day-to-day actions of local governments.

I think there can be little doubt that President Carter is sincerely committed to strengthening research and development in this country. You've read that in the newspapers; you've also heard Dr. Press say that there are special plans for the research and development budget of 1979. President Carter is so interested in this general problem of science and technology and aspects such as the lagging of innovation and the lagging of basic research that in formulating the 1979 budget and future budgets he personally wanted to examine in considerable detail the allocations for science and technology. With that in mind, he picked two budgets and went through them in considerable detail. One of those budgets was that of the National Science Foundation. I spent two and a half hours with the President, the Vice President, the Director of the Office of Management and Budget, and the Science Advisor, literally going through the NSF budget on a line-by-line basis. The questioning was sharp and interested. "Why were we doing this?" "Why were we doing that?" "Why wasn't there more effort to ensure bridges between universities and industry?" "What were the potential applications?" When we came right down to the intergovernmental science program, the President spoke in considerable detail. He showed interest in it and pointed out that he had some unique pressures on him in that regard; namely, Governor Busbee.

I have looked at the recommendations coming out of this Conference. I think the notion of regional innovation groups is good. I'm not going to comment specifically on the recommendations because I know that there have been lots of suggestions for changes discussed.

I'll conclude by saying that the last eight years have been incredibly productive years for NSF in this area. The progress that's been made has been important. Your job, of course, at this conference is to be sure to get the attention of NSF's Jack Sanderson, Bill Wetmore, Bob Crawford, and Bruce Reiss. Be sure that your ideas are fed to them. Be sure they're being responsive to your ideas, because they're going to play a key role in putting these ideas before ISETAP.

Thank you.

Question and Answer Period Following Dr. Atkinson's Remarks

Ted Tedesco:

What are some of the essential criticisms that are being leveled against this program, in the sense of this critical examination that is being made by OMB. Can you give us some clue as to how to focus our attention on the particular problems that they see with it?

Dr. Atkinson:

Ted, I don't think that there are specific criticisms. In the early days, one view was that this was just another program. Another view asked why it was an NSF program. One has to often wonder: Exactly why **was** this program originated at NSF? There are a number of other natural homes for it in the government. I'm very pleased that it did evolve out of NSF. It is clear that other departments are going to have to build into this and that there will have to be a broader base of support in the final program than the base of support from NSF. I'm sure that any plan that comes out of OMB will have that broader base of support. One of the key issues on Dr. Press's agenda in the next few weeks is to get a number of the agencies in this area to make a solid commitment toward these activities. It takes a while for any idea to get attention in Washington, and in getting attention, there have to be some very sharp focal points that demonstrate the effectiveness of an idea. I think such demonstrations have been made. Each time we go to OMB I find the response more positive than in the previous years.

Robert Cox:

Some of us from the New England Innovation Group testified at the hearing before the National Science Board, and we were surprised that they didn't know about us or about this kind of an activity. At the Parker House that evening we stayed an extra hour to get the word to them. We followed up with some background about what this investment looked like and tried to suggest that around the country there were other types of investments. Dr. Sanderson knows that four members of our policy committee came down to Philadelphia to participate in those workshops. We need somebody on that Board who understands what they're hearing when it comes from the constituency in this room, and I'm saying that in this part of the country and the other parts of the country represented at this table, there are those people. It's a peer group relationship. We're not university presidents. We're practitioners of the art of the possible, and that's a little different kind of a ball game. We want to have that heard.

Dr. Atkinson:

I'm glad you put it that way. Carleton McMullin, of course, is on the National Science Foundation Advisory Council.

Robert Cox

We'd like him to have company.

Dr. Atkinson:

I'm not saying that there should not be members on the Board with these specific interests. What I'm saying is that I doubt if there's much likelihood of really changing the legislation to prescribe three members. You might put forward the recommendation that the President consider these factors when he makes appointments to the Board. You might even ask the National Science Board to put such a recommendation before the President but it is a case of the President making the decision. We don't have a statute that says there will be so many university presidents, etc.

But you hit on something very special. I gather that at the Philadephia meeting you walked away with the impression that the National Science Board members there were not as clear about this program as you would have liked. Again, I'm simply saying that time has its impact, and I think you are getting attention.

Robert Cox:

I sensed they were interested, very interested in what this little activity was that was vibrating out here.

Dr. Atkinson:

It vibrates very vigorously in NSF.

Wayne Wedin:

I'm really very delighted to hear you say that the ideas that you read about, watched, and heard discussed today are good, and that the sense of timing is not only appropriate, but right. Beyond the refinement of the recommendations in the blue book, are there things which those of us in this room who feel as you do on this subject could do to assist you in promulgating those ideas?

Dr. Atkinson:

Frankly, you're probably more sophisticated in the politics of Washington than I am. I may be wrong, but I do believe ISETAP and the inputs being provided there now have given us enough focus to put the White House and OMB solidly behind this activity. I think to the extent that you're making a contribution, the Congress should know about it, too.

Wayne Wedin:

That's a fair comment, and I think that you can depend upon us to do that.

Richard Eckfield:

We're pleased, and I'm sure I speak for everyone, that you feel you have gotten such a high return on your investment. We've managed to be able to get as much information in whatever form through as a result of that modest investment compared to the rest of the investments of the Foundation. I hope you view that as a very good return on the investment you've made in us. I think it's appropriate to remind you, however, that what we're really after is you. I mean that in the most positive sense; we've had this discussion before; it probably can't be reinforced too many times. It is, in fact, the mind of the scientist that we're lacking and that we're seeking from all of these arrangements. I'm struck by the fact that you're reminding us to make sure that Jack, Bill, and Bruce know what it is we want, and they have, in fact, come more than half way to meet us. Let me also remind you that we're after Eloise Clark--she is the person that is in charge of the behavioral sciences--we've been focusing on the applied sciences. People used to believe cities were run by a power elite. There's a book based on the city of Atlanta (which, it is interesting to note, was funded by NSF), that documented what the power structure in the city was. It's interesting to note that NSF did that type of behavioral research; they don't do that anymore. We all know that the power elite stuff is dead (we say citizen participation now). What is new, we don't know. Why? Because another part of NSF we want to develop positive relationships with, just like we're developing positive relationships with Dr. Sanderson and everyone else, still needs to be brought along. I think in fairness to you--it's important that you know that we thank you for putting up with us--our motives are well intended. We're trying to get you to help us and it looks like we're making progress in the intergovernmental applied science area. Whether you know it or not, you've got an awful lot more that you could give us, and we want it, and we're looking forward to it.

Dr. Atkinson:

In the late sixties and early seventies there was a lot of talk about applying science. In the process, there was a certain turning away from fundamental research and often a mistaken effort to push the applied side of things. That was a mistake. We have to keep a strong base of fundamental research going, but we also have to have a strong base of applied and developmental work going. One can't be done at the expense of the other. One thing that always made me a little uneasy in that earlier period was the view that somehow we could draw attention of Federal laboratories, of our universities and the like, to some of these problems. The difficulty is that in order to draw that attention, to get the universities interested, there has to be some level of core funding. The

Federal government has never quite done that as effectively as it could.

I see this program as one area where, with some degree of Federal funding, we can really build those bridges between local governments, universities, laboratories, and industry in the regions. The issue of whether there's enough work going on in the applied social science areas,I agree, is an area for real concern. But, again, I don't always see NSF as being able to fill all these needs. There is an NIH, there is a Department of Labor, there is a Department of Justice with an LEAA which should be much more effective and responsive. Our role is a leadership role, I think. No one is going to be happy with the degree of leadership we've given, but at least we recognize our leadership role and hope to do better in the future.

You'd be amazed at how important an exchange like this is for me. Just having read the documents once again, hearing some of the remarks at the end of the session, hearing the discussion over this luncheon period has been very useful.

Carleton McMullin:

Dr. Atkinson, we do thank you, and I'd like to take a couple of moments to say a couple of words. One of the advantages I have of being last on my feet is to be able to comment in this area. Many of you know Dick Atkinson, and others of you haven't had the opportunity to become personally acquainted with him. But let me tell you from a year of association that I've had--this man has tremendous leadership talents. It's just absolutely amazing what he is able to do in the whole range of scientific involvement that the Foundation has, and to be on top of it and to keep moving, and he's doing just such an excellent job. The mere fact that he's with us today expresses to all of us his interest in what is taking place in this area. It's almost an infinitesimal part of the NSF budget, and yet it's so important and he's given recognition to that importance by his presence. Dick, we thank you for that sincerely, and we're tremendously pleased that you're here. I think one other comment, however, that we would leave with you that you can take back is that attitudes are important, and attitudes don't require dollars. Simply speaking, attitudes are habits of thought, and we need your interpretation within the other directorates of the Foundation, of those that serve on your many advisory boards and panels, to help us try to interpret the relevance of what we're trying to do on the cutting edge of implementation of science, even basic science, that ultimately feeds into applied and to our communities. We know that you can be helpful in terms of that attitudinal side.

I'd like to close with just a couple of comments. We've had an excellent meeting in this day and a half. I thought this morning of a couple of biblical passages that just for some reason struck me a little bit about what we're doing. I remember Romans: "Be ye transformed by renewing of your mind." Now in a sense this is what we've been about. It's been the visionary side of what we stand for. Some real risk-takers are in this room.

But, you know, sometimes we need to think back, because what is new to us is really very old, and we do need to renew our minds in that sense and finally the motivation, the charge ahead, is the one that you're familiar with from Matthew. "Ask and it shall be given to you, seek and ye shall find, knock and it shall be opened unto you." With that, we appreciate your attendance and thank you.

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IUTEP

The International Urban Technology Exchange Program (IUTEP)
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 452-7748

Costis Toregas, P/I, American Director
Bill Oxburg, European Director

NSF Funding: $75,000 through March 1979

PROGRAM SUMMARY

IUTEP is a progam for involving U.S. cities within the Innovation Network in applications of urban technologies that have been developed and used in Western Europe. IUTEP is organized by technology organizations and local government public interest groups in France, West Germany, the United Kingdom, and the United States.

The overall program objective is to perform actual transfers of European technologies to U.S. local government. Secondary objectives include: the identification of European technologies which are capable of meeting the needs of U.S. local governments; increasing the awareness of the potential of foreign technology to help U.S. local government; and facilitating the wider use of foreign technology first transferred to an initial U.S. site.

Achievements to date have included the actual transfer of ROMA, a complex French computer method for refuse collection routing and analysis, to the city of St. Petersburg, Florida. This effort has progressed well, and city management expects to save $50,000-100,000 annually through ROMA. A second-round transfer of ROMA to Dallas, Texas, is now underway, and negotiations are in progress with 35 additional U.S. cities and counties to transfer ROMA on a second-round basis.

Other achievements include: the actual transfer, now in progress, of an interactive computer graphics system for developing a segment-oriented geographic base file, ANCER, to Hillsborough County, Florida; the development of plans for the actual transfer of an English manual analysis methodology, Nomograms, to Anaheim, California; the identification of 70 other foreign technologies potentially suitable for transfer to U.S. local government; the assessment by a steering committee of U.S. local government officials of those technologies, and the selection of 18 for potential transfer; development of a set of written recommendations for improving international technology transfer processes based on the ROMA project; and the development and dissemination of five information bulletins describing foreign technologies judged by the steering committee as being of high priority for transferring to U.S. local government.

Steering Committee Chairman:
Jim Favour, *Assistant City Manager and*
Urban Consortium Representative, Dallas, Texas

Urban
Consortium

The Urban Consortium for Technology Initiatives (UC)
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 452-7756/7755

John K. Parker, P/I
Carol A. Whitcomb, Acting Director, Urban Consortium

NSF Funding: $934,000 from 1974 through July 1979

PROGRAM SUMMARY

The UC operates as a forum in which the nation's 28 largest cities and eight urban counties meet to define their needs, select high priority needs for R & D, encourage the transfer of information and technologies and direct targeted research efforts at the federal level. Public Technology, Inc. (PTI) serves as the secretariat for the Consortium.

The Consortium's broad objective are: (1) to develop an effective mechanism for linking the nation's major urban jurisdictions in efforts to apply science and technology in planning and program execution; and, (2) to establish interinstitutional arrangements to improve the delivery and implementation of S & T applications to meet urban needs.

The UC work program involves, or has involved in the first two years of its existence, building an agenda of problem statements, establishing R & D priorities, participating in cooperative R & D, facilitating demonstrations and proof-of-concept testing, improving information flows regarding transfer, stimulating market aggregation for the application of developed solutions and building new insititutional working relationships. Most recently, UC has put particular emphasis on devising a means of participating in the International Urban Technology Exchange Program and on building working relationships with commerce and industry.

Operations are based on a highly structed use of "task forces," which encourage interactions among technology suppliers in government and industry to meet defined needs embodied in selected, high priority projects. Once the full Consortium has accepted a TF recommendation, a User Design Committee is appointed to develop detailed specifications for the desired solution/application (as a methodology or technology "product"). When necessary R & D activities have been successfully accomplished, the UDC is then responsible for developing transfer-dissemination "packages" — guides for local government action-implementation.

PROGRAM RESOURCES AND PRINCIPAL PARTICIPANTS

The Consortium links with and complements three associated programs: the Technology Information Exchange; the Urban Technology System; and the new Community Technology Initiatives Program. The UC is also able to work closely with the Federal Laboratory Consortium, particularly by virtue of support from major mission agencies — HUD, DOT, NSF, and Commerce.

PRINCIPAL PARTICIPANTS INCLUDE:

Atlanta, Georgia
Consortium Representative
David E. Rivers
Commissioner of Budgeting & Planning

Baltimore, Maryland
Consortium Representative
Bernard L. Berkowitz
Physical Development Coordinator,
Planning Department

Boston, Massachusetts
Consortium Representative
David Rosenbloom
Commissioner, Department of Health
and Hospitals

Chicago, Illinois
Consortium Representative
Albert H. Baugher
Assistant Commissioner,
Department of Planning

Cleveland, Ohio
Consortium Representative
Dr. Bancroft Henderson
Executive Secretary, Department
of Human Resources

Columbus, Ohio
Consortium Representative
Michael J. Gable
Finance Director

Dade County, Florida
Consortium Representative
William F. Hampton
Special Assistant to the County Manager

Dallas, Texas
Consortium Representative
James R. Favour
Assistant City Manager

King County, Washington
Consortium Representative
Donald G. Phelps
County Administrative Officer

Los Angeles, California
Consortium Representative
John R. Coombs
Assistant City Administrative Officer

Maricopa County, Arizona
Consortium Representative
Charles W. Miller
County Manager

Memphis, Tennessee
Consortium Representative
Henry R. Evans
Chief Administrative Officer

Milwaukee, Wisconsin
Consortium Representative
Herbert A. Goetsch
Commissioner of Public Works

New Orleans, Louisiana
Consortium Representative
Harold R. Katner
Director of the City Planning Commission

New York City, New York
Consortium Representative
Jeffrey C. Stern
Director, Regional and Intergovernmental
Programs,
New York City Planning Department

Philadelphia, Pennsylvania
Consortium Representative
Dr. I.M. Levitt
Executive Director, Mayor's Science
and Technology Advisory Council

Phoenix, Arizona
Consortium Representative
Peter Starrett
Assistant City Manager

Denver, Colorado
Consortium Representative
Chris Tomasides
Director of Management

Detroit, Michigan
Consortium Representative
TO BE ANNOUNCED

Hennepin County, Minnesota
Consortium Representative
Dale A. Ackmann
County Administrator

Hillsborough County
Consortium Representative
TO BE ANNOUNCED

Houston, Texas
Consortium Representative
Marsha Wayne
Executive Assistant to the Mayor

Indianapolis, Indiana
Consortium Representative
Eugene Waltz
Technical Advisor to the Mayor

Jacksonville, Florida
Consortium Representative
Michael E. Langton
Senior Administrative Assistant

Jefferson County, Kentucky
Consortium Representative
William Wardemwerper
Coordinator, Federal Programs

Kansas City, Missouri
Consortium Representative
David H. Olson
Assistant City Manager

Pittsburgh, Pennsylvania
Edward Deluca
City Development Coordinator

Prince George's Co.
Consortium Representative
Robert W. Wilson
Chief Administrative Officer

St. Louis, Missouri
Consortium Representative
William Wilson
Director of Streets

San Antonio, Texas
Consortium Representative
Louis J. Fox
Assistant City Manager

San Diego, California
Consortium Representative
John Lockwood
Assistant City Manager

San Diego County, California
Consortium Representative
John W. Pearson
Policy and Management Director

San Francisco, California
Consortium Representative
Bernard Tietelbaum
Executive Deputy to the Mayor

San Jose, California
Consortium Representative
Sally Reed
Grants Coordination Supervisor

Seattle, Washington
Consortium Representative
William Stafford
Manager, Intergovernmental Relations

Washington, D.C.
Consortium Representative
George L. Jenkins
Assistant Director, Office of Budget and Management Systems

URBAN CONSORTIUM MEMBERS

Atlanta
Baltimore
Boston
Chicago
Cleveland
Columbus
Dallas
Denver
Detroit
Houston
Indianapolis
Jacksonville
Kansas City
Los Angeles
Memphis
Milwaukee
New Orleans

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Phoenix
Pittsburgh
St. Louis
San Antonio
San Diego
San Francisco
San Jose
Seattle
Washington, D.C.
Dade County, Florida
Hennepin County, Minnesota
Hillsborough County, Florida
Jefferson County, Kentucky
King County, Washington
Maricopa County, Arizona
Prince George's County, Maryland
San Diego County, California

The Urban Technology System (UTS)

UTS

Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 452-7700

John K. Parker, P/I
Stanley R. Goldberg, *Project Director*
Arleigh H. Markham, *Regional Manager*
Donald B. Vitz, *Regional Manager*

NSF Funding: $5.5 million 1973-1980 Other Funding: $7.5 million 1973-1980

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PROGRAM SUMMARY

UTS consists of a network of 30[*] local governments throughout the U.S. (50-500,000 population) organized as an experiment to test, on a broad geographic scale, an integrated technology delivery system consisting of three interlinked components: (1) a system manager created by non-federal public sector officials for the specific mission of promoting public technology; (2) specially recruited technology agents reporting to local government chief administrators; and, (3) "technical backup" R & D institutions, to provide active support to these local governments through the technology agents.

The current project (and experimental) objectives are threefold: (1) to determine the effectiveness of an integrated technology delivery system in increasing the degree of technological innovation in local governments, public service market aggregation and non-federal investment in R & D directed toward the public sector; (2) to develop data on the effectiveness of alternative forms of the system, as a guide to forming public alternatives; and (3) to increase linkages with other networks and programs providing technology transfer services to local government.

A governing assumption underlying UTS is that a major problem confronting local officials is the need for the capability to analyze technical problems and to apprise decision-makers of technical information and options in an organized and manageable way. The intent of UTS is to stimulate accelerated technological innovation, market aggregation and non-federal R & D investment by: (1) increasing communication channels among the system's components; (2) developing awareness of technological opportunities, needs and capabilities; (3) promoting education, training and related policies and programs for releasing knowledge of applicable opportunities; and (4) promoting an understanding of market aggregation possibilities.

PROGRAM RESOURCES AND PRINCIPAL PARTICIPANTS

UTS draws resources from Public Technology, Inc., universities, non-profit research institutes, private industry, federal laboratories and other regional innovation groups and networks.

[*] Three sites are still being negotiated with as of November 30, 1978.

Participants in the Urban Technology System:

UTS Site	**TECHNOLOGY AGENT**
Akron, OH	Lou Catalina
Albuquerque, NM	Erwin Hensch
Arlington, TX	John Bayles
Eugene, OR	Greg Page
Evanston, IL	Richard Nordquist
Grand Rapids, IL	Peter Willis
Great Falls, MT	(Vacant)
Henrico County, VA	(Vacant)
High Point, NC	Lee Hodorowski
Independence, MO	Robert Svehla
Kettering, OH	William VanTrease
Little Rock, AR	Daniel Bunten
Lower Merion Twp, PA	Anthony Iannacone
Madison, WI	Gordon Bethke
Worcester, MA	Charles Hill
Minneapolis, MN	Norman Yarosh
Nashville, TN	Elmer Young
Newark, NJ	(Vacant)
Oklahoma City, OK	James Carter
Pasadena, CA	John Barney
St. Petersburg, FL	Ed Carlton
San Jose, CA	Monroe Postman
San Juan, PR	Thomas Flynn
Spokane, WA	William Pupo
Syracuse, NY	Warren Weaver
West Hartford, CT	(Vacant)
Wichita, KS	Glen Dockery

TECHNICAL BACKUP SITE	**CONTACT**
Battelle Columbus Labs	Jules Duga
ITT Research Institute	Michael Hill
Naval Underwater Systems Center	Jim Atkinson
Texas A & M University	Joe Foster
University of California (Berkeley)	Nick Bevilacqua

Community Technology Initiatives Program (CTIP)
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 452-7700

Dr. Theodore Maher, *Program Director*

PROGRAM SUMMARY

What is CTIP? The Community Technology Initiatives Program is a new, national program to address the common scientific and technological needs of municipalities, townships, and counties under 50,000 in population. CTIP constitutes a network of selected localities from across the country. The results and benefits of program activities will be potentially applicable to government operations in thousands of jurisdictions.

Why was CTIP created? Development of the CTIP program is a response to the fact that policy planning, decision-making, and the delivery of public services are increasingly affected by scientific and technological factors. In many cases, understaffed and underfinanced local governments are poorly equipped to handle complex issues on their own. The smaller localities in particular face common needs and high-priority pressures associated with energy shortages, waste treatment issues, street maintenance, solid waste management, water quality, and similar science and technology-based demands.

CTIP constitutes a necessary first step for strengthening local government capabilities in applying science and technology to critical issues. CTIP will provide a forum and a meeting ground for local officials to coordinate objectives and strategies together. It will be a technology transfer system; a people-to-people network for smaller local governments established in an atmosphere of practical helpfulness. Through this mechanism, the users in local government will determine the priorities and guide the application of science and technology responses.

What are the CTIP objectives? First-year CTIP program objectives include the following:

(1) Establish a needs assessment process for defining specific and common local government issues that relate to science and technology.

(2) Develop a priority problem agenda for participating localities under 50,000 in population.

(3) Adapt and implement on a pilot basis, two specific science and technology applications based on priority user needs. Some examples of potential applications include equipment management systems, public facility location methodologies, land use techniques, and solid waste collection and disposal methodologies.

(4) Develop a program plan for the second and subsequent years of CTIP operations, which will include communicating and working with federal agencies, industry, universities, and other institutions and disseminating program results to other local governments.

How will CTIP be organized? CTIP consists of elected or appointed officials from 28 cities and townships and 3 counties from around the nation. All jurisdictions are below 50,000 in population. A 9-member steering committee is drawn from total membership and serves to develop overall policy and organizational aspects of the CTIP program. Meeting twice during the first year, the program membership will exercise critical program responsibilities relating to problem definition, review and priority setting, requirements definition, and task force participation.

PTI will serve as Secretariat to CTIP. As such, PTI personnel will be responsible for day-to-day program management, responsibility for conduct of all work for the delivery of products, and for all necessary dissemination and utilization efforts.

CTIP will strive for maximum institutional interaction and communication with existing local government organizations such as state municipal leagues, the International City Management Association, and regional and local innovation groups. These interactions will be greatly facilitated through a partnership with the National League of Cities. As a participant in the program, NLC will assist with information dissemination and CTIP program planning.

PTI is currently systems manager and secretariat, respectively, for two additional organizational initiatives. They are the Urban Technology System (UTS) and the Urban Consortium. UTS comprises a network of technology agents located in the central staff offices of jurisdictions between 50,000 and 500,000 in population. A basic purpose of UTS is the stimulation of technolgical innovation and problem-solving in response to member government priorities. The Urban Consortium consists of all cities over 500,000 population and 8 urban counties. This organization has developed an urban government problem agenda and Consortium task forces are in the process of undertaking research and development efforts on behalf of the large cities and counties of the nation.

In sum, two major networks are in place and have a demonstrated track record in utilizing science and technology resources applicable to local government problem-solving. The technology agents, back-up resources, and task force operations of these two programs are potential resources to the CTIP program. While geared to the needs of governments over 50,000 population, the existing methods of operation, current state-of-the-art searches, and other information that have resulted from Consortium and UTS operations will be utilized by CTIP personnel as appropriate.

Alabama

Center for Government and Public Affairs
Auburn University at Montgomery
Montgomery, AL 36117
(205) 279-9110

Dr. Chester C. Carroll, *Principal Investigator*
Dr. Raymond B. Wells, *Project Manager*

NSF Funding: 1978 $127,900

PROGRAM SUMMARY

AIG is a cooperative program of Alabama's State and Local Governments and the University of Alabama system (University of Alabama, University of Alabama in Birmingham, and the University of Alabama in Huntsville) and the Auburn University system (Auburn University and Auburn University at Montgomery). The basic methodology used is a needs survey to establish the problems to be addressed, a prioritization of those needs, and identification of the best available university resources to meet those needs.

The objectives of the AIG are as follows:

1. To develop an intergovernmental system through which local and state governmental units may tap federal and state public research and development resources and apply them to their problems and processes.
2. To facilitate and promote federal-state-local research and development relationships.
3. To disseminate to governmental units results of research and development projects by production of reports, manuals, and handbooks.
4. To conduct an agenda building workshop and needs assessment effort.
5. To create an interstate linkage for project transfer, adoption and application.
6. To institutionalize the system.
7. To experiment with an intergovernmental R & D formula for sharing the cost of research and development transfer. To begin the process of securing permanent state support for the system.
8. To begin the process of extending the R & D delivery system to the private sector by using the university R & D system as an "honest broker" between industry and government.
9. To extend the R & D delivery system to include the Federal Labs. (A linkage with the Federal Laboratory Consortium).

AIG has funded over 40 projects in the last two years. Projects are funded on a matching basis with NSF funds matched by both the universities and the local government or state agency involved in the project. The risk sharing in innovation and research and development is a principal operating strategy.

Colorado

COLORADO INNOVATION CENTER
P.O. Box A097 University Center
4200 East 9th Avenue
Denver, Colorado 80262
(303) 394-8701

Dr. F. William Heiss

NSF FUNDING: $194,000 (1975 to date)

PROGRAM SUMMARY

The Colorado Innovation Center (CIC) was established to bridge the gap that often exists between local government agencies and available science and technology. It seeks to assist participating local governments in Colorado to solve problems and improve public service. After a first year program which provided assistance for the City and County of Denver, the scope was enlarged in the second year to add Boulder County and the cities of Englewood, Aurora, Lakewood, and Longmont. Overall coordination is provided by the Denver Urban Observatory, and principal technical expertise by the Denver Research Institute and Martin Marietta Corporation.

The CIC action program has three basic elements: a plan for employing a team of technical advisors and a government organization specialist to assist local government agencies in identifying areas where science and technology can alleviate governmental problems; a plan for identifying resources that can aid in solving these problems; and active assistance in applying and implementing the solutions. The CIC management board provides overall direction, reviews and evaluates technical problems and solutions, and establishes problem priorities. The management board consists of representatives from the six local governments, the two principal resource organizations, and the Colorado Municipal League. The local representatives are the contact persons in their communities identifying possible problems and arranging for assistance. The resource organizations either provide the assistance or locate someone who can. The Colorado Municipal League provides statewide information dissemination.

Since the program was initiated, local government agencies have identified 180 problems requiring scientific and technical assistance. To date, action has been taken on seventy of these. CIC utilizes the cooperation of over 100 private industries and public institutions for solving problems. In addition, CIC has established an annual Innovative Public Manager Awards program.

Plans for the third year program include continued assistance to Colorado cities and counties in solving technical solutions; broadening the resource base for problem solution; expanding the current dissemination network; and assisting the states of Utah, Wyoming, Nebraska, and Montana in setting up innovation centers in their states.

GEORGIA INNOVATION GROUP
Georgia Department of Community Affairs
Georgia Municipal Association
Georgia Institute of Technology
Georgia State University
University of Georgia
Association County Commissioners of Georgia
Atlanta, Georgia
(404) 656-3836

Mary Lou Rothove, *Project Director*

NSF FUNDING: 170,000 to date

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PROGRAM SUMMARY

GIG was created by the State of Georgia to develop methods for systematically identifying and solving short term and longer range problems facing local government through the application of state government and university resources. GIG is comprised of members from three universities, the Georgia Municipal Association (representing municipal government), the Department of Community Affairs (state agency responsible for improving local government services) and the Association County Commissioners of Georgia (representing county government).

GIG has five specific objectives: (1) design of a system for identifying problems facing local governments; (2) testing mechanisms involving a coalition of state and university resources for solving identified problems; (3) investigating (experimentally) innovative service delivery techniques; (4) encouraging replication of successful technology applications at the local government level; and (5) achieving system institutionalization within state government over a three to four year period.

The group is designed to undertake three basic types of activities: first, provision of problem-oriented skills and resources--to be matched against identified solution needs; second, meeting information needs (including effective dissemination) for use in local service delivery innovation/application; and third, mobilization of resources at the local government level to better carry out innovation and productivity-enhancing programs. Initially, the Department expanded its existing statewide network to participate with local governments in problem identification-definition; concurrently, a catalog of university resources was compiled. GIG works with an advisory committee of 10-15 innovative local government representatives to assist with the formal needs assessment, problem identification and definition, and product or solution transference.

The first completed project resulted in an administrator's handbook, speaker's kit, slide/tape presentation, community involvement structure, and school curriculum for junior high use in **Combating and Reducing Vandalism to Municipal Property.** The recipient city is planning an expansion of their program county-wide, and other agency funding is anticipated to assist with transference of these products to other communities in Georgia before replication to other states.

Projects still underway during this first year cover the following subjects:

A Methodology to Analyze Capital Investment in Water Systems. Ultimate solution package will contain handbook for use by local government officials to estimate costs of expanding water supply systems, determine cost impact of environmental regulations, evaluate water system performance and identify funding alternatives for expansion.

Local Government Management Options. Project product will contain a numerical scale for use by local officials to identify the appropriate management model for their particular community characteristics.

Simplified Financial Management Procedures for Small Georgia Cities and Counties. This project is directed at the under 50,000 population district and will provide handbooks on financial management procedures, ways to increase revenues and decrease expenditures, and inventory creation and control.

A Guide to Collecting Community Development Data in Cities Under 50,000. This guide will direct a city on using volunteers to obtain data on neighborhoods and on assembling and interpreting this information.

Guidelines on Analyzing Alternative Resource Recovery Systems for Small Jurisdictions. This manual will enable communities to understand and analyze the profitability of resource recovery options.

Model Programs to Assist Small and Mid-Sized Cities with Downtown Development. The ultimate product of this project will assist with the level of communication skills among local downtown merchants, improving and applying their management and marketing skills to competing with outward migration of the economic core.

A Guide for Analyzing the Costs and Benefits of Municipal Annexation. This project will produce a guide for use in analyzing the costs and benefits of annexation to both the city and to the residents of the proposed area.

Inter-University Task Force/Local Government Advisory Committee

Committee Chairman
Mr. Richard L. Bolin, City Manager
Newnan, Gerogia

Committee Vice Chairman
Mrs. Jewel John
Clark County Commission
Athens, Georgia

The Honorable David T. Barrow, Mayor
Bowdon, Georgia

Mr. Joe Brewster, Jr., County
Administrator of Gordon County
Calhoun, Georgia

Mr. C. Allen Brown, City Manager
Elberton, Georgia

Mr. Jack M. Crane, City Manager
Marietta, Georgia

The Honorable Ann A. Crichton
Mayor, Decatur, Georgia

Mr. James Crowdis, City Manager
Dublin, Georgia

The Honorable Thomas Faircloth
City Council
Thomasville, Georgia

Mr. Thomas E. Grey, Chairman
Ware County Board of Commissioners
Waycross, Georgia

Mr. Phin Horton, City Manager
Valdosta, Georgia

Mr. Lewis L. Leonard, County
Administrator
Spalding County
Griffin, Georgia

Mr. A. A. Mendonsa, City Manager
Savannah, Georgia

The Honorable Buckner Melton, Mayor
Macon, Georgia

PROGRAM RESOURCES AND PRINCIPAL PARTICIPANTS

In addition to local officials, the project will use undergraduates and graduate research assistants. GIG will interface both with seven sister institutions undertaking similar efforts and with the Urban Technology System through the Atlanta Urban Consortium agent. The project will also take advantage of the dissemination resources of the Georgia Municipal Association, the Association County Commissioners of Georgia, the eighteen (18) Area Planning and Development Commissions and the Department of Community Affairs.

Principal participants include:

Inter-University Task Force
Official Members and Alternatives

Georgia Department of Community Affairs

Commissioner Henry M. Huckaby
Project Investigator
Department of Community Affairs
Atlanta, Georgia

Mary Lou Rothove
Project Director
Department of Community Affairs
Atlanta, Georgia

Georgia Institute of Technology

David Clifton
Engineering Experiment Station
Atlanta, Georgia

Steve Day
Engineering Experiment Station
Atlanta, Georgia

Georgia State University

Brad Doss
Institute of Governmental Administration
Atlanta, Georgia

Bill Jones
Institute of Governmental Administration
Atlanta, Georgia

University of Georgia and Cooperative Extension Service

Jim Elkins
Institute of Government
Athens, Georgia

Joseph Pou
Cooperative Extension Service
Athens, Georgia

Howard Schretter
Department of Geography
Athens, Georgia

Josiah Hoskins, Jr.
Cooperative Extension Service
Athens, Georgia

Georgia Municipal Association (Advisory Member)

Elmer George
Georgia Municipal Association, Inc.
Atlanta, Georgia

Bill Thornton
Georgia Municipal Association, Inc.
Atlanta, Georgia

Association County Commissioners Georgia (Advisory Member)

Hill Healan
Association County Commissioners
of Georgia
Atlanta, Georgia

Jay Ricketts
Association of County Commissioners
of Georgia
Atlanta, Georgia

New England

NEW ENGLAND INNOVATION GROUP
39 Pike Street
Providence, RI 02903
(401) 272-3437

Robert A. Cox, *Director*

NSF FUNDING: $817,600 (Commencing September 1975)
OTHER FUNDING: $147,500 (DOC, DOE, HUD, NASA and Non-Federal)
AGENCY SUPPORT - IPA POSITIONS: $162,000 (Federal Labs, DOC)

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PROGRAM SUMMARY

Introduction

NEIG is a six state intergovernmental science and public technology program initiated in September 1975 by the Rhode Island League of Cities and Towns in conjunction with the U.S. Department of Commerce and the Naval Underwater Systems Center. NEIG's applied research objective is to establish a functioning intergovernmental science and technology utilization network linking, through communication and practical assistance projects, those with needs (users) to resources, drawn from the public, private and academic sectors.

Major characteristics of the New England Innovation Group are:

The use of municipal leagues or similar public interst groups to reach local officials and "aggregate" markets based on their needs;

Demonstrating the effectiveness of using circuit rider technology agents on a statewide basis as opposed to individual cities;

Attempting to use the Federal Laboratory Consortium as well as universities and private industry as prime technology resources;

Demonstrating the economic development impact of a regional technology utilization program through the aggregation of unmet public needs which can be linked to underutilized science and technology resources;

Special emphasis on the development of minority businesses.

What Has NEIG Done

Energy Conservation. NEIG is focusing on the commercialization of energy management services for public buildings using technologies such as infrared thermography. This activity has been funded by several agencies and is proving to be an outstanding example of the transfer of Federal Laboratory Consortium technology to the public sector.

Economic Development/Jewelry Industry. NEIG is enabling a major regional industry (jewelry) to use science and technology resources to develop economically feasible and environmentally acceptable solutions to industrial waste treatment problems. The first phase of this project was recently funded; it is recognized as one of the most unique attempts to link science and technology to a major regional and national economic development and environmental management program.

Public Works Management. Nearly 50 municipalities in four states have shown interest in this program to transfer existing management systems, i.e., vehicle maintenance and work reporting. No federal agency to date has shown a significant interest in supporting this activity despite the fact that a wealth of adaptable systems and procedures are available to improve this government service which is so visible to the taxpayer.

Project NEEDS. NEIG is providing support to the Elementary School Principals' Association of Connecticut to initiate (in conjunction with their counterparts in the other five New England States a professional improvement program for the "smallest" and "least wealthy" school districts in the region). NEIG's support will allow the inclusion of an energy management component in this program.

Financial Management Assistance. NEIG is supporting development of a financial management assistance program for small communities in northern New England. This work is being organized in cooperation with the New England Municipal Center.

Minority Business Development/Hydrotool. This NASA supported project has been delayed for nearly six months due to a product liability problem. Eight units are available for testing at over 50 sites throughout the country once the problem is resolved.

How Is It Being Done

Policy Development Committee - Organized in October 1975. Composition includes scientists, professionals, administrators and politicians.

Science & Technology Agents - These "circuit riders" operated in Connecticut, Massachusetts and with the New Hampshire House of Representatives.

Technology Utilization Program Managers - Federal Laboratory Consortium personnel and university staff functioned in the areas of energy conservation and public works management. Other managers proposed for public health and safety, human resources and public policy management.

Networking - This is the continuing effort to link municipal leagues, federal labs, universities, other innovation groups and Public Technology, Inc., into a national intergovernmental science and public technology network. This was the focus of NSF's Third Annual Innovation Group Conference. The Conference Working Paper was developed by NEIG.

Institutionalization - NEIG intends to become a non-profit corporation early in 1979.

NEW ENGLAND INNOVATION GROUP
POLICY DEVELOPMENT COMMITTEE

CHAIRMAN
Vincent A. Cianci, Jr.
Mayor, City of Providence

VICE CHAIRMAN
William R. Murphy
Selectman
Chelmsford, MA

Dr. Andrew Assur
Chief Scientist
U.S. Army Cold Regions Research
and Engineering Laboratory
Hanover, NH

R.V. "Bud" Giangrande
DOT-Transportation Systems Center
Cambridge, MA

Carl Spangler
Commissioner Housing of Community Affairs
State of Vermont
Montpelier, VT

William J.Jones
Energy Lab
Massachusetts Institute of Technology
Cambridge, MA

Stanley Judkins
President, Envico
West Lebanon, NH

Louis Kaplan
Assistant Dean
Yale University School of Medicine
New Haven, CT

Helen Keyes
Secretary's Representative
U.S. Department of Commerce
Boston, MA

Jerry Lessuck
Economist
R.I. Department of Economic Development
Providence, RI

Dr. Bruce Poulton
Chancellor
University System of New Hampshire
Durham, NH

George Roberts
Speaker, House of Representatives
Concord, NH

James K. Rogers
Director of Environmental and Energy Conservation
Raytheon
Lexington, MA

Kennedy Shaw
Executive Director
Mass. League of Cities and Towns
Boston, MA

Dr. Harry Stevens
Participation Systems, Inc.
Winchester, MA

Authorized Institutional Representative
Rhode Island League of Cities and Towns
Kenneth F. Payne, Executive Director
39 Pike Street, Providence, RI 02903

Oklahoma

OKLAHOMA INNOVATION GROUP
Center for Local Government Technology (CLGT)
Oklahoma State University
Stillwater, Oklahoma 74074
(405) 624-5000 ext. 6055

Joseph H. Mize, *P/I*
James Shamblin, *Project Director*

PROGRAM SUMMARY

The Center for Local Government Technology (CLGT) is a program for Oklahoma to provide technical assistance to city and county government through its land-grant state university. The major objective of this program is to apply engineering and management technology to problems of city and county government to help cut costs and increase output. This objective is achieved through a two-pronged effort which consists of the following components:

> The Division for Research and Development provides research and development on problems of local government.
>
> The Division for Extension activities combines with the statewide network of Oklahoma State University in the delivery of technical information and training.

Some of the activities of the Center have been directed toward various longer term projects. The majority of these completed projects have been funded by individual faculty research grants and are now in various stages of the delivery process. These are listed below:

Police Information System	An information system for the police decision maker.
Costing of Public Services	This program provides a computerized summary of the rates charged for various municipal services and an instruction manual for the computation of revised rate schedules to meet increased costs.
Handbook for Newly-Elected County Commissioners	A detailed handbook which describes the responsibilities of county commissioners as established by state law, plus material on roads and bridges, maintaining inventory records, etc.
Job Descriptions for Small Cities	A how-to-do-it manual illustrating how a small city can develop its own set of job descriptions.
Manpower Management System for Street Maintenance	A manual for a systematic method of planning and scheduling a street maintenance program.
A Safety Program for Towns and Cities	A detailed handbook which shows how to set up a safety program in cities and towns.
An Energy Conservation Program for Public Schools	A down-to-earth manual showing how public schools can reduce energy consumption.

The Center provides a quick response service to questions and short-term problems. This is aided by the use of a "hot line" number which local government officials can use to call collect to discuss these types of problems, (405) 377-1335. The Center also writes and distributes Fact Sheets on pertinent topics. The following is a list of those Fact Sheets.

Patching Potholes
Building A Tennis Court
Providing Paved Parking Areas
Outdoor Recreational Lighting
Stabilizing Soil for Road Construction
Introduction to Water Treatment
Effects of Drainage Design on Road Performance
School Bus Routing
Scheduling Police Manpower
Procedures for Initiating, Upgrading, or Expanding Water and Wastewater Related Facilities
Residential Solar Heating
Aggregate Surfaced Roads and Their Maintenance
Introduction to Wastewater Sewage Treatment
NPDES Discharge Monitoring Report
Constructing A Reinforced Concrete Tennis Court
Constructing An Asphalt Tennis Court
Swimming Pool Sanitation and Equipment Maintenance
Operation and Maintenance of Swimming Pools
Disinfection of Swimming Pool Waters
Asphalt Paving Materials
Selecting a Consulting Engineer
Solar Energy for Public Buildings
Solid Waste Management System Cost Guidelines
Maintenance of Above-Ground Steel Water Storage Tanks
Asphalt Paving Maintenance Part I - Patching
Asphalt Paving Maintenance Part II - Causes and Repair of Cracks
Asphalt Paving Maintenance Part III - Causes and Repair of Distortions
Asphalt Tennis Court Repair and Maintenance

Pacific Northwest Innovation Group (PNIG)
211 E. 11th Street, Suite 103
Vancouver, Washington 98660
(202) 693-2956

James F. Lynch, *Executive Director*

NSF Funding: $140,000 (September 1977 to August 1979)

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PROGRAM SUMMARY

The Pacific Northwest Innovation Group - the newest of the Regional Groups nationally, represents state and local governments in Idaho, Oregon and Washington. Through a grant initially awarded on September 30, 1977 by the National Science Foundation to the Pacific Northwest Regional Commission, PNIG was formed to gather and disseminate technological and scientific innovation information to governmental entities in the Pacific Northwest and to help them identify and resolve their common problems. The grant was in response to a need Lynch became the Executive Director and assisted by members of a three-state intergovernmental task force, made PNIG a reality.

From the outset, PNIG was to represent all three levels of government in the Pacific Northwest-State, County and City. On September 7, 1978, PNIG was incorporated in the State of Washington as a non-profit corporation. A Board of Directors and an Executive Board have been elected as well as Corporation Officers. The elected officers represent the three various jurisdictions: President Erling O. Mork, City Manager of Tacoma, Washington; Vice-President Laurence R. Sprecher, Director of the State of Oregon's Executive Department; Secretary, Frank A. Bishop, Director of Cowlitz County, Washington's Budget/Personnel Administrative Department -- an ideal slate to insure representation at all levels. PNIG membership now stands at twenty-six: 3 states, 5 counties and 18 cities.

With the basic organizing being established, PNIG is currently concentrating efforts to: 1) complete an in-depth needs assessment, 2) seek solution to the identified needs, 3) establish contacts with universities and private industry. Further, Oregon's Office of Science and Technology, a functional and cooperating arm of PNIG is being looked at as a model to replicate in the other two states. Additionally with seven technology utilization professionals representing nine PNIG members, methods are being assessed to use their talents most beneficially within the region as well as insuring interaction with the three national innovation groups - Urban Consortium, Urban Technology System and Community Technology Initiatives Program, as well as the independents such as Boise Center for Urban Research and the City of Tacoma.

SIG

Southwest Innovation Group (SIG)
Predecessor: California Innovation Group
300 Pasadena Center
Pasadena, CA
(213) 577-0515

NSF Funding: $1,175,000 (1974 to date)

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The California Innovation Group (CIG), a statewide consortium of eleven California incorporated cities, one county and the League of California Cities, expanded in 1978 to include two additional California cities and two Arizona cities. Reflective of this expansion, CIG changed its name to SIG - the Southwest Innovation Group.

The last year has been a planning period for SIG to identify how it can effectively expand, institutionalize itself in the future, and continue to work towards carrying out the following objectives: 1) use a team approach to selected urban problems and to demonstrate this approach in solving regional science and technology utilization problems, 2) develop additional resources for supporting urban technology development, and 3) continue the process of internalizing S&T operations, including management of transfer and use, within local government.

SIG places a science advisor in each city hall, working for the city manager. The science advisor spends a portion of his time working on projects that the SIG Board of Trustees has identified as being of common importance to all members; the remaining time is spent on projects assigned by the city manager. SIG operations frequently employ the "lead city" concept for joint operations, in which case the lead city science advisor is designated as project manager.

The representative of the League of California Cities is involved in all phases of the project, providing interface to other California cities.

Tennessee

Tennessee Innovation Group
Municipal Technical Advisory Service
. . . a unit of the Institute for Public Service
The University of Tennessee
205 White Avenue Building
Knoxville, Tennessee
(615) 974-5301

Donald F. Norris, *Project Manager*

NSF Funding: $90,000 for First Year Program

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PROGRAM SUMMARY

The Tennessee Innovation Group was created by the University of Tennessee and began operation in August, 1978. The Group is composed of twelve smaller Tennessee cities (size range: 3,600 -- 50,000) and receives staff support from the University's Municipal Technical Advisory Service.

The purpose of the Tennessee Innovation Group is to further the construction of a comprehensive technology delivery system for small municipalities in Tennessee within which technologies developed elsewhere can be adapted and tested; new technologies can be developed; technologies can be transferred to non-project cities within the State; and costs, benefits and management requirements of new technologies can be identified and shared with other delivery systems.

The Tennessee Innovation Group is supported by an organization with 30 years of municipal problem-solving experience, the University's Municipal Technical Advisory Service. Not only will the Innovation Group benefit from this relationship, but also technologies developed for or adapted to the needs of the Innovation Group will assist the Advisory Service to improve its ability to respond to the longer-term, more in-depth needs of smaller Tennessee cities.

The initial priority needs identified by the Innovation Group cities for project action are: 1) municipal use of minicomputers; 2) street rejuventation; 3) municipal productivity; 4) municipal risk management; 5) master fire prevention planning; 6) growth management; and 7) infiltration/inflow control. It is anticipated that specific projects responding to at least the first four of these needs will be underway in several cities in Tennessee during FY 1979. The remaining priority needs plus new needs that the Innovation Group cities will add to the project will be addressed during the second and third project years.

Texas

Texas Innovation Group
Center for Urban Programs
Texas A&M University
College Station, Texas 77843
(713) 845-4527

Donald C. Moore

PROGRAM SUMMARY

The Texas Innovation Group is an organization of local governments working together and with various other agencies to develop and transfer new technologies to their operations. Active participation by member governments is the cornerstone to the TIG operations concept. Working with the Center for Urban Programs of Texas A&M University, which performs TIG's staff function, the members identify the problem areas in which they need assistance and guide the development and execution of projects to find the solution to those problems. TIG's program is thus constantly directed toward problems presently facing local government.

As a beginning point of the TIG program development process, a needs identification survey tool titled **Assistance Solitaire** was designed. This extensive Q sort of questionnaire was administered to over 300 Texas city officials to have them identify their needs for improved technical assistance and research. Of these elected officials, city managers, and key staff members, only six have not returned the instrument. After returning their responses, the Center compiles the data and analyzes the data to develop a profile of needs. This information is returned to the city officials who then engage in goals setting sessions. The instrument and approach to learn what cities need has proven very successful. A by-product of the process appears to be that it increases impetus to start assistance projects ranked high in the needs analysis.

A result of the needs analysis program has been the development of a four element program of assistance. The first element is the monthly **Dispatch,** a short explanation of a new innovation. Case studies are the second element. These are technical reports detailing every aspect of innovations that have been successful in one jurisdiction so that without further information they can be transferred to a new government. The third and fourth elements of the program are single and multi-jurisdiction direct assistance. These are projects developed to research specific problems faced by the jurisdictions involved and develop new solutions to them

Projects providing TIG cities assistance are underway or completed in nine cities. Topics for these projects are: (a) economic development and commercial revitalization; (b) data processing and management information system analysis; (c) commercial and residential building code revision for energy efficiency, rehabilitation, and historical preservation; (d) sewer system replacement forecasting; (e) street maintenance, repair and paving forecasting; (f) electronic communication improvements; and (g) public safety productivity improvements and performance measurement.

Presently being planned are projects such as: (1) supervisory level personnel training targeted at specific needs; (2) local government reworking of railroad crossings: (3) a glossary of local government terminology for elected officials; (4) several automated management tools; (5) three operational cost savings methods; and (6) productivity measurement. All are being asked for by the administrators through their own organizations. All projects, it is felt, will lead to more effective and efficient local government.

Indianapolis

Indianapolis Technical Innovation Program
2421 City-County Building
Indianapolis, Indiana 46204
(317) 633-6195

Eugene W. Waltz, *Program Manager*

NSF Funding: $45,000 (second year 1979)

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PROGRAM SUMMARY

The Indianapolis Technical Innovation Program has been operating since 1973 within the internal structure of the City of Indianapolis using an interinstitutional arrangement with the Indianapolis Center for Advanced Research (ICFAR)

The major program objectives are to: (1) investigate, develop and implement solutions to management and operational problems in City departments; (2) execute all program activities within the regular budgeting, administrative and operating processes of City government; and (3) subject the program plans, budget and results to the City-County Council for annual evaluation.

The institutional coupling of the City government with ICFAR enables direct relationships with private industry and Purdue and Indiana University which, along with the City of Indianapolis, are the incorporating institutions of ICFAR. This unique interinstitutional arrangement enables multi-institutional technical resource teams to be employed directly on City problem/project activities.

The Indianapolis program relies on the Urban Consortium and its subscription with Public Technology, Inc., for national innovation network activities.

Milwaukee

Milwaukee Science and Technology Utilization Council
Mayor's Office
Milwaukee, Wisconsin 53202
(414) 278-2200

Herbert A. Goetsch, *Principal Investigator*
Frederick A. Klein, *Project Director*

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PROGRAM SUMMARY

The STUC project was initiated in 1975 to encourage the transfer of technology to municipal activities and programs. The STUC is composed of members of the local science and technology community. They have been recruited from prominent positions in local industry and educational institutions. The Project Director is a member of the Mayor's staff.

The STUC has sought to assist Milwaukee officials with a variety of technology based problems. Areas of R&D activity include air pollution measurement, energy conservation, analysis of heavy metals in local sewerage and water sludge, the use of rubber as a paving material, and sludge composting. R&D funds have been jointly provided by NSF and local sources.

Secondary goals of the STUC include the stimulation of local economic development, improving the cost-effectiveness of municipal operations and encouraging commercialization of technology having an urban application.

The STUC project has a special focus on harnessing the resources of local industrial, commercial and educational institutions. It also seeks to interact with various national S&T networks and institutions. A major goal of the current year is the creation of a Wisconsin Innovation Group involving several other municipalities and counties in Wisconsin.

Philadelphia

Mayor's Science and
Technology Advisory Council (M—STAC)
City of Philadelphia
Office of the Mayor
428 City Hall Annex
Philadelphia, PA 19107
(215) 686-4563

Dr. I.M. Levitt, *Project Director*

PROGRAM SUMMARY

The Mayor's Science and Technology Advisory Council (M-STAC) was created in 1972 as a pilot program to determine optimum methods for the interaction of science and technology with the political, economic, and societal forces in an urban community. Its objective is to integrate scientific expertise into the policy making and operational structure of city government in a systematic and pre-planned manner.

To accomplish this objective, seven divisions (Communications, Energy, Environment, Housing, Transportation, Urban Affairs, and Urban Design) were created with chairmen and vice chairmen for each. All members of the divisions are volunteers except that the chairmen and vice chairmen receive a modest honorarium for each meeting.

Tasks are presented by the City Commissioners to the division for discussion and action; if additional expert advice and study are required, division chairmen can convene ad hoc committees with members chosen from a pool of 150 council members. Once a task is completed, the solution is transmitted to the Mayor's Office and back to the initiating city agency or it can be transmitted directly to the city agency.

It is self-evident that no city can afford to "buy" the caliber of the professionals involved with our problems. These volunteers come from academia, research organizations, laboratories, and other professions. Philadelphia is fortunate in that several of these men are of international stature and head up research activities with national overtones.

Because M-STAC is an apolitical organization, we can appeal to people of all political orientations and receive favorable responses to our requests for help.

The staff of M-STAC has also succeeded in working very closely with the federal agencies such as the U.S. Department of Transportation, (U.S.D.O.T.), the former Energy Research and Development Administration (ERDA), the Department of Energy (DOE), National Aeronautics and Space Administration (NASA), the Department of Defense (DOD), the Environmental Protection Agency (EPA), etc. so that some funding and manpower have been allocated to the City in seeking resolution of current problems.

The staff of M-STAC has, through its contacts in the scientific and technological community, initiated projects that were and can be of significant help to the City.

Rochester Engineering Society
55 St. Paul Street
Rochester, New York 14604
(716) 546-3570

Andrew C. Hirsch, *Project Manager*

Rochester
Engineering
Society

PROGRAM SUMMARY

The development of the New York Innovation Group is being coordinated by the Rochester Engineering Society's County of Monroe/City of Rochester Technology Transfer Program. A percentage of Technology Transfer staff time is being committed to the Innovation Group. Contacts with other New York State localities and possible demonstration projects are ongoing activities at this time.

It is anticipated that direct National Science Foundation support for the Innovation Group will be featured as a separate part of the July 1, 1978 to June 30, 1980 grant proposal. Staff support in the form of an additional person will be added.

The direction that the Innovation Group will take is one that will feature citizen participation and governmental control by the ultimate users. This is a similar approach to the one taken by the County of Monroe/City of Rochester Technology Transfer Program. The ultimate administrative structure will be determined by the members of the group.

The City of Rochester/County of Monroe Technology Transfer Program has been funded by the NSF since November 1, 1976. At that time a $15,000 planning grant was awarded to the Rochester Engineering Society to start the program. Since then two additional NSF grants have been awarded bringing the grand total of NSF funds committed to $108,610 (covering two years and eight months of operations and planning).

Major work has included the following items: Energy Conservation, Energy Records Management, Park Accessibility for Handicapped People, Volunteer Technical Participation, Solid Waste Management, Interactive Graphic, a Sewage Treatment Agency Consolidation Assessment, etc.

NACo

County Research and Innovation Sharing Project
National Association of Counties Research Foundation
1735 New York Avenue, N.W.
Washington, D.C. 20006
(202) 785-9577

Bruce B. Talley, *Principal Investigator*
Sally A. Rood, *Project Manager*

NSF Funding: $58,000 (July 1978 to February 1979)

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PROGRAM SUMMARY

The National Association of Counties Research Foundation is conducting the County Research and innovation Sharing Project. Initial objectives are: (1) identify the major problems confronting county governments that are amenable to scientific and technological solutions, (2) increase the awareness of county officials of the benefits derived from successful technological innovation at the local level, and (3) evaluate the National Association of Counties' primary innovation identification mechanism -- the "New County, U.S.A. Center" Achievement Award Program.

Project staff will work with affiliate organizations of the National Association of Counties, other public interest groups, Public Technology, Inc. and technology agents in national, regional and state innovation groups and networks ultimately to increase county user input to the process of technology transfer. The project will seek to facilitate linkages between interested counties and outside resources (such as, for example, the Federal laboratories) and innovations will be addressed through site visits and case studies. In this regard, emphasis will be placed upon solutions to problem areas which are noticeably distinct from those of other levels of governments. In addition, a strategy will be developed for disseminating information about technical briefs and other technical resources, workshops and training sessions, and federal R&D policies and activities impacting counties.

A task force provides overall guidance to the County Research and Innovations Sharing Project. It will assist with some project activities, evaluate the entire project upon completion and recommend future efforts. The task force is comprised of the following persons:

Mr. Daniel Casey, Supervisor
Milwaukee County
Milwaukee, Wisconsin

Mr. Donald Cleveland
Executive Director
Iowa State Association of Counties

Mr. William P. Cooke, Councilman
New Castle County
Wilmington, Delaware

Mr. Gerald E. Fisher, Chairman
Board of Supervisors
Albemarle County
Charlottesville, Virginia

Mr. Richard W. Gatten, P.E.
Shoshone County
Wallace, Idaho

Mr. Tom Gloor, President
Jefferson County Commission
Birmingham, Alabama

Mr. Webster J. Guillory
Deputy Assessor
Orange County
Santa Ana, California

Mr. Kenneth A. Kieselburg
Supervisor
Harlem Township
Rockford, Illinois

Mr. William Koniarski, Chairman
Board of Commissioners
Scott County, Minnesota

Ms. Jeanne Malchon, Commissioner
Pinellas County
Clearwater, Florida

Mr. T.U. Moore, Judge
EL Paso County
El Paso, Texas

Mr. Neal Potter, Councilman
Montgomery County
Chevy Chase, Maryland

Mr. Frank Raflo, Supervisor
Loudon County
Leesburg, Virginia

Mr. Walden D. Toevs, Chairman
Board of Commissioners
Boulder County
Boulder, Colorado

Mr. Gerald Weston, Supervisor
Walworth County
Whitewater, Wisconsin

Mr. Floyd E. Wilson, Jr., Councilman
Prince Georges County
Upper Marlboro, Maryland

Mr. Sanford E. Wool, Deputy Counsel
Maryland-National Capital Park and Planning Commission

Federal Laboratory Consortium

Federal Laboratory Consortium
for Technology Transfer (FLC)
Code 3203 Naval Weapons Center
China Lake, CA 93555
(714) 939-7325

G.F. Linsteadt, *Secretariat and Chairman, FLC*

NSF Funding: $184,000

PROGRAM SUMMARY

There are many definitions of technology transfer within the Federal Laboratory Consortium; it is generally described as the process by which existing knowledge, facilities, or capabilities developed under federal R&D funding are transferred to fulfill actual or potential public or private needs. To promote this transfer, over 180 major Federal R&D Laboratories and Centers, representing ten Federal agencies have joined in an informal Technology Transfer Consortium. These agencies include: Department of Defense, Transportation, Interior, Commerce, Agriculture, Justice, Energy, Health, Education, and Welfare, National Aeronautics and Space Administration and the Environmental Protection Agency. Only a few states do not have a member facility within their boundaries. The purpose of this Consortium is to increase the use of these laboratories' unique technical expertise and R&D products toward the solution of problems facing our government agencies and private industries.

Within the FLC, technology transfer is accomplished in a variety of ways. One approach is the performance of civilian-oriented R&D work by one of the Consortium laboratories with funds provided by the requesting institution. These R&D projects are directed towards application to civilian problems. Thus, the American taxpayer derives double benefit from government R&D expenditure. Other members of the Consortium are chartered and funded to specifically work in the civilian area. Thus, they are directing their technology transfer efforts toward increasing the use of their research results by decision-makers and operational agencies in the public and private sectors.

ICMA

LOCAL GOVERNMENT MANAGEMENT INNOVATIONS TRANSFER PROJECT (ITP)

International City Management Association
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 293-2200

Fred S. Knight, *P/I;* Michael D. Rancer, *Project Director*

NSF FUNDING: $515,000 (1975 to date)

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PROGRAM SUMMARY

The Innovations Transfer Project is a system developed by the ICMA for identifying "in place" local government management innovations (technology-new management approaches), evaluating them from the practitioner's perspective and disseminating information regarding them by a variety of techniques.

Project objectives are to refine and document operation of this system, to bring about more expeditious sharing of practitioner-validated innovations and to heighten understanding, among both local government officials and citizens, of the major role science and technology can play in government program planning and execution activities. Longer range goals involve creation of effective institutional linkages with federal agencies involved in technology transfer/innovation directed to local government requirements and institutionalizing an umbrella-type innovation dissemination program within ICMA's Management Information Service (after two further years of NSF support).

The key element in the ITP is on-site verification and assessment of identified innovations by teams of municipal practitioners. Once on-site evaluation is successfully concluded, many dissemination techniques are employed, notably the ICMA publication series "Innovations in Municipal Management." "Technology Field Days" have also been used in both Washington and regional settings.

Beginning in 1978 the Innovations Transfer Project has an international component, in conjunction with the Council for International Urban Liaison. ICMA and CIUL are helping the City of Dayton, Ohio, to transfer an air quality monitoring and improvement program from Stuttgart, Germany.

USCM

SCIENCE AND TECHNOLOGY UTILIZATION SESSIONS MAYORS LEADERSHIP INSTITUTE

United States Conference of Mayors
1620 Eye Street, N.W.
Washington, D.C. 20006
(202) 293-4914

Michael A. diNunzio, *General Counsel and Senior Program Manager*

NSF FUNDING: $100,000 (August 1, 1977 - December 31, 1978)

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PROGRAM SUMMARY

This program involves participation by the National Science Foundation in the Mayors Leadership Institute (MLI) sessions, a series of intensive 2 ½-day seminars sponsored by USCM for small groups of mayors only on substantive topics, e.g., financial management. Under this program, mayors are able to obtain technical and other information in a suitably condensed and sharpened format and context with the expenditure of a minimal amount of time.

Incorporation of S&T Utilization sessions in these seminars has the following objectives: (1) to meet the need for greater science and technology input; (2) to stimulate mayors' awareness and use of S&T resources available to them through national and regional innovation group networks; and, (3) to identify the innovators and early adopters of S&T practices for future leadership roles.

As initially envisioned, NSF would present S&T-based material in a panel format, consisting of: (1) a nationally recognized person who would outline the national interests in enhanced local use of S&T resources; 2) an experienced local official, intimately familiar with use of technology in municipal settings; 3) a mayor who has utilized, and profited from, this experience and can speak authoritatively about it; and, 4) a technician who would explain available hardware and software as well as the methodology of implementation. Such presentations may also be supplemented by a range of written materials, field trips, etc. First year operation will be carefully evaluated by MLI/USCM, resulting in delivery of the following outputs: 1) a needs assessment as perceived by those attending MLT; 2) a priority-based agenda of S&T work items identified by attendees; 3) an identification of resources which could be mobilized to meet these ends; and, 4) an identification of specific mayors whose interest and understanding merits further consideration of them for S&T activities within the mayors' peer groups.

Resource Participants

Substantial use will be made of the USCM participation in the Urban Consortium as well as on-going programs such as the Research on Productivity Measurement Systems for Administrative Services, conducted by the Public Service Laboratory at Georgetown University.

USCM

U.S. CONFERENCE OF MAYORS SCIENCE AND TECHNOLOGY PROJECT

U.S. Conference of Mayors
1620 Eye Street, N.W.
Washington, D.C. 20006
(202) 293-7318

Richard E. Eckfield, *Project Manager*

PROGRAM SUMMARY

The U.S. Conference of Mayors' Science and Technology project seeks to promote the routine use and/or consideration of the application of science and technology by city governments in their policy planning, program planning, and program execution activities. This is accomplished: (1) by increasing the awareness of Mayors regarding the usefulness of this resource through general education and information programs directed toward the USCM membership; and (2) through the use of the USCM as a national institutional forum through which additional national resources, both governmental and private, and increased priority for science and technology related issues of interest to cities can be negotiated between city and federal interests.

Specific activities include: the development of a needs assessment and action plan which sets forth the items which are considered to be required in order to achieve the sufficiently broad based level of support necessary to realize the city use of science and technology objective. Project work tasks include institutional activities designed to mobilize resources to this end; involvement in experimental programs of interest to Mayors and which bear on the project objective; education and marketing efforts designed to heighten the understanding of issues and accomplishments which are directed at an audience consisting of both the USCM membership and federal officials; and an evaluation of the processes by which the objective of greater assimilation by Mayors of available information regarding city use of science and technology can be achieved.

Conference Participants

Mr. Michael C. Ahrens
CTIP Technology Agent
211 E. 11th Street, Suite 103
Vancouver, WA 78660

Ms. Anna Aiello
Program Manager for Local Government
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Dr. James Atkinson
Office of Special Programs Development
Naval Underwater Systems Center
New London Laboratory
New London, CT 06320

Dr. Richard Atkinson
Director
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. Joseph N. Baker
Public Technology, Inc.
The Pasadena Center
300 E. Green Street
Pasadena, CA 91101

Mr. Alan Beals
Executive Director
National League of Cities
1620 Eye Street, N.W.
Washington, D.C. 20006

Dr. Alvin B. Biscoe, Jr.
Special Assistant, University Programs
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. Louis Blair
Executive Secretary, ISETAP
Office of Science & Technology Policy
New Executive Office Building
17th & Pa. Avenue, N.W.
Washington, D.C. 20500

Mr. Donald J. Borut
Director, Management Development Center
International City Management Association
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mr. Ross Calhoun
City Manager
City Hall
P.O. Box 231
Arlington, TX 76010

Mr. William Lee Chew
Washington County Board of Commissioners
Ramona, OK 74061

Mayor Vincent A. Cianci, Jr.
City Hall
Providence, RI 02901

Mr. William Claggett
U.S. Department of Commerce
14th & Constitution Avenue, N.W.
Washington, D.C. 20230

Ms. Barbara E. Cohn
Council of State Community Affairs Agencies
444 North Capitol Street, Suite 312
Washington, D.C. 20001

Mr. Burton T. Conway
City of Plainfield
515 Watchung Avenue
Plainfield, NJ 07061

Mr. Ray Corpuz
Office of Intergovernmental Affairs
City of Tacoma
County-City Building, Room 355
Tacoma, WA 98402

Mr. Robert Cox
Director
New England Innovation Group
39 Pike Street
Providence, RI 02903

Mr. Robert Crawford
Director, Intergovernmental Programs
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Ms. Barbara Davis
New England Innovation Group
39 Pike Street
Providence, RI 02903

Mr. Stephen Day
Georgia Institute of Technology
Atlanta, GA 30332

Mr. Michael diNunzio
U.S. Conference of Mayors
1620 Eye Street, N.W., Suite 600
Washington, D.C. 20006

Mayor Humphrey J. Donnelly, III
City Hall
Newport, RI 02840

Mr. Juda Drob
Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

Mr. Richard Eckfield
Science & Technology Project
U.S. Conference of Mayors
1620 Eye Street, N.W.
Washington, D.C. 20006

Mr. James S. Elkins, Jr.
Institute of Community & Area Development
University of Georgia
Athens, GA 30602

Dr. Albert R. Elwell
Office of the Chancellor
University System of New Hampshire
Lee Center East
Durham, NH 03824

Mr. Leon Eplan
Leon S. Eplan & Associates
One Barksdale Drive N.E.
Atlanta, GA 30309

Mr. John Eveland
Technology Transfer Division
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. Raymond L. Farrow
Army Materials & Mechanics Research Center
Watertown, MA 02172

Ms. Katie Feidelson
Assistant Director
Connecticut Conference of Municipalities
956 Chapel Street
New Haven, CT 06510

Dr. Irwin Feller
Pennsylvania State University
Institute for Research on Human Resources
Pennsylvania State University
407 Graduate Building
University Park, PA 16802

Mr. Paul A. Flynn
City Manager
City Hall
145 Taunton Avenue
East Providence, RI 02914

Mr. David Gatton
U.S. Conference of Mayors
1620 Eye Street, N.W.
Washington, D.C. 20006

Mr. R.V. Giangrande
DOT-Transportation Systems Center
Mail Code 150, Kendall Square
Cambridge, MA 02142

Mr. Stanley R. Goldberg
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mayor Thomas F. Hall
City Hall
Millington, TN 38053

Ms. Tara Hamilton
CTIP Project Director
National League of Cities
1620 Eye Street, N.W.
Washington, D.C. 20006

Mr. Jerome P. Hartman
Municipal Technical Advisory Service
University of Tennessee
Knoxville, TN 37916

Dr. F. William Heiss
Denver Urban Observatory
Box AO97 University Center
4200 East 9th Avenue
Denver, CO 80262

Mr. Ronald G. Heroux
Naval Underwater Systems Center
Code 0702
Newport, RI 02840

Mr. George F. Hickey, Jr.
CTIP Technology Agent
City Hall
Rockville, MD 20850

Ms. Margaret M. Higgins
U.S.Civil Service Commission
310 Post Office Annex
Providence, RI 02903

Mr. Matthew Hillsman
Naval Underwater Systems Center
New London, CT 06320

Dr. Robert Hiltabrand
Coast Guard R & D Center
Avery Point
Groton, CT 06340

Mr. Andrew C. Hirsch
Rochester Engineering Society, Inc.
55 St. Paul Street
Rochester, NY 14604

Mayor Charles F. Horn
Kettering Government Center
3600 Shroyer Road
Kettering, OH 45429

Mr. C. Nelson Hoy
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Ms. Mary-Margaret Jenior
Division of Buildings & Community Systems
Department of Energy
20 Mass. Avenue, N.W.
Washington, D.C. 20545

Mr. Samuel Jernigan
Planning Director
City Hall
Newport, RI 02840

Mr. John Joyner
Deputy Executive Director
National League of Cities
1620 Eye Street, N.W.
Washington, D.C. 20006

Mr. Stanley Judkins
President, Envico
Star Route #4
Windsor, VT 05089

Mr. Louis J. Kaplan
Assistant Dean
Yale University School of Medicine
333 Cedar Street
New Haven, CT 06510

Mr. Maryland D. Kemp
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Dr. Richard A. Kenyon
Rochester Engineering Society
55 St. Paul Street
Rochester, NY 14604

Mr. Nicholas F. Kepple
Office of U.S. Representative
Christopher J. Dodd
1 Thames Plaza
Norwich, CT 06360

Mr. Frederick A. Klein
Executive Director
Science & Technology Utilization Council
200 East Wells Street
Milwaukee, WI 53202

Mr. Fred Knight
ICMA Innovations Center
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Dr. Valarie C. Lamont
Participation Systems, Inc.
43 Myrtle Terrace
Winchester, MA 01890

Mr. Robert D. Lauer
Director, Industrial Programs
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Dr. I.M. Levitt
Executive Director
Mayor's Science & Technology Advisory Council
428 City Hall Annex
Philadelphia, PA 19107

Mr. Ronald E. Lewis
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mr. O. James Linenberger
Program Manager for Local Government
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. G. F. Linsteadt
Federal Laboratory Consortium
Code 3203 Naval Weapons Center
China Lake, CA 93555

Mayor Dennis M. Lynch
City Hall
Pawtucket, RI 02860

Mr. James F. Lynch
Executive Director
Pacific Northwest Innovation Group
211 E. 11th Street, Suite 103
Vancouver, WA 98660

Mr. L. A. Maciula
Center for Local Government Technology
505 Engineering North
Oklahoma State University
Stillwater, OK 74074

Ms. Jackie Maddox
Colorado Innovation Center
P.O. Box A097 University Center
Denver, CO 80262

Dr. Theodore J. Maher
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mr. William Malloy
City Hall
Pawtucket, RI 02860

Mr. Vincent A. Mannion, Jr.
CTIP Technology Agent
39 Pike Street
Providence, RI 02903

Mr. Ward McAllister
C.S. Mott Foundation
503 S. Saginaw Street
Flint, MI 48502

Mr. John McFall
Federal Laboratory Consortium
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. Carleton E. McMullin
City Manager
City of Little Rock
City Hall, Markham & Broadway
Little Rock, AR 72201

Ms. Margaret M. McNamara
Assistant for State & Local Govt. Programs
Naval Underwater Systems Center
New London, CT 06320

Mr. James L. Mercer
General Manager
Battelle Southern Operations
101 Marietta Tower, Suite 3525
Atlanta, GA 30303

Ms. Jean L. Mestres
Council for International Urban Liaison
818 18th Street, N.W.
Washington, D.C. 20006

Mr. Gerry Miller
Intergovernmental Relations Division
Room 306, State Library Building
Salem, OR 97310

Mr. L. Joe Miller
Deputy Executive Secretary, ISETAP
NEOB Room 3011
17th & Pennsylvania, N.W.
Washington, D.C. 20500

Mr. Nick Montanarelli
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. Donald Moore
Center for Urban Programs
Texas A&M University
College Station, TX 77843

Mr. Bill Moyer
Oklahoma Municipal League
201 Northeast 23rd Street
Oklahoma City, OK 73105

Dr. Richard Munis
New England Innovation Group
39 Pike Street
Providence, RI 02903

Dr. Donald F. Norris
Tennessee Innovation Group
University of Tennessee
Institute for Public Service
Knoxville, TN 37916

Ms. Mary O'Brien
U.S. House of Representatives
Science & Technology Committee
House Annex II — Room 3273
Washington, D.C. 20515

Mr. Bryant Pake
Community Development Department
Berlin, NH 03570

Mayor Gordon H. Paquette
City Hall
Burlington, VT 05401

Mr. John K. Parker
President
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mr. Kenneth F. Payne
Executive Director
Rhode Island League of Cities & Towns
39 Pike Street
Providence, RI 02903

Mr. Richard G. Pennoch
Deputy City Manager
City of Pasadena
100 N. Garfield Avenue
Pasadena, CA 91109

Mr. Ronald Phillips
721 Catland Drive
Great Falls, Va

Mr. Robert Pratt
Executive Director
New England Congressional Caucus
53 D Street, S.E.
Washington, D.C. 20003

Mr. Gerald W. Price
Technology Agent
2313 Redfern Street
Huntsville, AL 35805

Mr. Michael Rancer
International City Management Association
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mr. Bruce Reiss
Program Manager for Local Government
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. James Rejfek
Department of Local Government
909 Leawood Drive
Frankfort, KY 40601

Ms. Michelle Riba
Technology Agent
Connecticut Conference of Municipalities
956 Chapel Street
New Haven, CT 06510

Mr. David Richtmann
Program Manager for Science and
Technology Resources
National Science Foundation
1800 G Street, N.W.
Washington, D.C.20550

Mr. Tom Rienerth
Onancock, VA
23417

Dr. J. D. Roessner
Senior Policy Analyst
Solar Energy Research Institute
1536 Cole Boulevard, Building 6
Golden, CO 80401

Ms. Sally A. Rood
National Association of Counties
1735 New York Avenue, N.W.
Washington, D.C. 20006

Ms. Mary Lou Rothove
Department of Community Affairs
32 Peachtree Street, Suite 600
Atlanta, GA 30303

Mr. Richard P. Rust
New England Federal Regional Council
John F. Kennedy Federal Building
Boston, MA 02203

Dr. Jack T. Sanderson
Director, Applied Science
and Research Applications
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Mr. Edward Seegmiller
City Hall
Sherman, TX 95090

Dr. James E. Shamblin
Director
Center for Local Government Technology
Oklahoma State University
813 Engineering North
Stillwater, OK 74071

Mr. R. W. Shortreed
Office of Intergovernmental Affairs
West Ford Road
Stafford Springs, CT 06076

Ms. Barbara Sokoloff
Planning Director
City Hall
Warwick, RI 02886

Ms. Yvonne Stegmiller
Office of Intergovernmental Affairs
City of Tacoma
Tacoma, WA 98402

Mr. Paul Steinbrenner
City Manager
City Hall
Newport, RI 02840

Ms. Linda L. Sutliff
Massachusetts Science & Technology
Foundation
Wakefield, MA 01880

Mr. Bruce B. Talley
Associate Director
National Association of Counties
1735 New York Avenue, N.W.
Washington, D.C. 20006

Ms. Marjorie Taylor
Public Affairs Education
Wichita State University
Wichita, KS 67208

Mr. Ted Tedesco
6951 Castlerock Drive
San Jose, CA 95120

Ms. Martha Walker
P.O. Box 231
Arlington, TX 76010

Mr. Eugene Waltz
City of Indianapolis
2421 City-County Building
Indianapolis, IN 46204

Mr. Wayne D. Wedin
City Manager
City Hall
401 S. Brea Boulevard
Brea, CA 92621

Dr. Raymond B. Wells
Center for Government & Public Affairs
Auburn University at Montgomery
Montgomery, AL 36117

Mr. William H. Wetmore
Director, Division of Intergovernmental
Science and Public Technology
National Science Foundation
1800 G Street, N.W.
Washington, D.C. 20550

Ms. Carol A. Whitcomb
Public Technology, Inc.
1140 Connecticut Avenue, N.W.
Washington, D.C. 20036

Mr. Ralph E. Williams
Colorado Innovation Center
P.O. Box A097 University Center
Denver, CO 80220

Mr. Harold F. Wise
Planning Consultant
1200 18th Street, N.W.
Washington, D.C. 20036

Ms. Susan Woolston
93 Veranda Court
Ponte Vedra Beach, FL
32082

Ms. Bonnie Wyper
Rhode Island State Council on the Arts
334 Westminster Mall
Providence, RI 02903

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